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FRATERNA

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International Hoya Association

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We have a new Research Department headed by Dale Kloppenburg as director. His new assistant is Mark Randal.

Editorial Policy

Errors of fact may occur from time to time in "Fraterna", it is the policy of the IHA to publish corrections of fact, but will not comment on matters of opinion expressed in other publications.

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TABLE OF CONTENTS

Page .	Front Cover: Hoya australis ssp. australis cv. Brookfield (Photo by Marcy Durst) .
Page 2	Declaration/Masthead . . . . .
Page 3	Table of Contents . . . . .
Page 4	Editors Note . . . . .
Page 5-14	Hoya australis article by Mark Randal (Photos by Mark R., D. Liddle & A. Wayman)
Page 15	Old/New Hoya House in Vista, Calif. . . . .
Page 16	Hoya Favorites....H. obscura by Ann Wayman . . . . .
Page 17-18	Hoya Favorites....H. siariae by Ann Wayman + photos by Monina Siar . . . . .
Page 19	Photo Gallery Descriptions (by Ann Wayman) . . . . .
Page 20	Photo Gallery (Photo Layout by Ann Wayman). . . . .
Page 21-23	Advertising . . . . .
Page 24	Back Cover . . . . .

Note from the Editor

Have you all had the opportunity to check out our new web page at www.international-hoya.org. There are still changes and improvements to be made but so far, we have set up a totally new system of charging your subscription, or any other offers (such as back issues etc.) using credit cards. You will see the pay pal logo, however, pay pal is just the service that will be processing your cards. You do not need to have an account with pay pal to use this service. We can now accept, Visa, Mastercard, American Express and Discover cards. We also do have a pay pal account for those of you who have an account with pay pal and would like to use that method. The account is under hoochymama007@hotmail.com. We get immediate confirmation via e-mail of your renewal or new subscription using either method.

There may be some of you who prefer to pay by check or money order. We can accomodate you also. Sandra Cook has volunteered to be our new membership secretary and all checks or money orders should be mailed directly to her at Sandra Cook, Membership Secretary, P.O. Box 1484, Priest River, Idaho 83856.

We will be reviving our slide show production with almost all new photos, but with the twist of your choice of slides if you have a slide projector or by DVD/CD Rom, if you would like to view the photos on a computer or on your tv screen. We don't have all the bugs out of this project yet but it's being worked on and should be available within a few months. These photo shows consist of 100 of some of the best hoya photos around by some of the best photographers. They come with complete identity and description notes for those of you who would like to have a hoya party. There is no charge to any of our members for checking out these slide shows. We do ask that you pay for postage and insurance and in the case of slides we ask for a $35.00 deposit check, which will be returned uncashed when the slides are returned. There is no deposit required on the CD's. Tammi Frank is our new slide librarian and should be contacted directly at Tammi Frank, 39 Wildwood Dr., Prescot, Arizona 86305, or e-mail wtfrank@peoplepc.com if you are interested in checking out our photo show.

As was mentioned in the last issue of Fraterna, we have regretably had to raise our subscription prices in order to keep up with the rising costs of producing our newsletter and paying all the other costs that go along with managing an International Organization. We sincerely hope it won't be a hardship and that you will all renew and stay with us.

I'm sure that some of you noticed in the last issue of Fraterna that the number of pages did not match the number of pages listed in the table of contents. This happened when I was getting the issues ready to be mailed and discovered that they had exceeded the weight limit. This excess in weight brought this issue to over 4 ounces and would have cost close to $200.00 more for overseas postage, so I pulled two sheets of paper which consisted of the advertising pages and the back cover which was blank. I'm sorry for the inconvenience. I promise to be more aware of weight limits before I make up the table of contents from now on.

Ann Wayman (Editor)

Hoya australis

by Mark Randal

Figure 1

HISTORY - Hoya australis was first collected by Europeans in 1770, by Banks and Solander, two of the scientists aboard James Cook's ship HMS Endeavor on his first voyage of discovery to the Pacific. The plant material was collected from Cape Grafton near Cairns, Queensland, on the Northeastern coast of Australia. The pacific island form of the plant was next collected from Tanna by George Forster, the Botanical Collector and draftsman on Cook's second voyage of discovery. Forster assigned it the name Asclepias volubilis, a name associated with a number of other species.

In 1810 Robert Brown created the genus Hoya. He moved two plants from the Genus Asclepias (Linnaeus) into this new Genus; Hoya carnosa (including the australis material), as the Holotype for the Genus, and Hoya viridiflora which was later moved out of the genus. The name Hoya australis was published in 1827 by James Traill, based on the Australian collection of Banks and Solander. Subsequent authors named plants from a number of areas in Australia and Papuasia which were later combined within Hoya australis by David Liddle and Paul Forster in the 1990's. They ultimately published/republished the complex as five separate sub-species.

The **Hoya australis** complex has spread throughout the world in cultivation, giving rise to numerous cultivars, varieties and hybrids (as well as many confusing and arbitrary designations). It is now one of the most popular and common species in cultivation, third only perhaps to **H. carnosa** and **H. bella**. Recently **H. australis** ssp. **oramicola** has been classified as a "vulnerable" species by the IUCN (International Union for the Conservation of Nature). More recently **Hoya australis** has begun to naturalize in Hawaii. Carol Noel recently found a seedling she has identified as **H. australis** ssp. **australis** growing near the beach which she has collected and introduced to the trade as **Hoya australis** ssp. **australis** from Kapoho.

TAXONOMY- Hoya australis is in the hoya section Pterostelma. Other members of this section are **H. calycina**, **H. naumanii**, **H. albiflora**, **H. magnifica**, and **H. subcalva** (syn. BSI-1). The specific epithet "australis" refers to the latin term for 'southern', not specifically to Australia. The five subspecies of australis have very similar flowers, too similar to warrant separating any of them into species status of their own. Since the leaf structure and growth habit of these plants varies so widely, they have been broken up into five supspecies groups based on leaf morphology and habit.

Figure 2: Close - up shot of flowers of H. australis ssp. australis

Here are the recognized subspecies, their publishers, and their synonyms (provided by David Liddle):

Hoya australis R. Br. ex Traill; **Hoya dalrympliana** F. Mueller; **Hoya keysii** F.M. Bailey; **Hoya pubescens** Reinecke; **Hoya oligotricha** ssp. **oligotricha** K. Hill

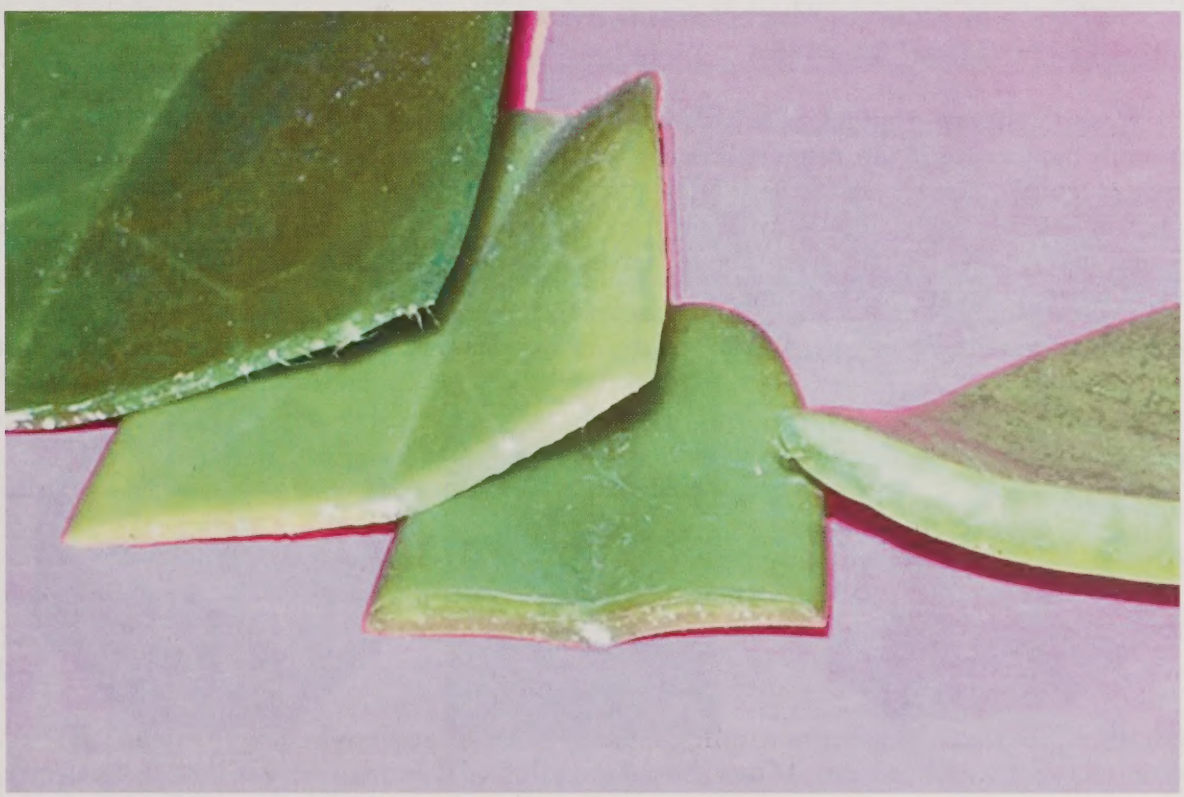
Gymnema recurvifolium Blume; **Hoya bicarinata** A. Gray: **Hoya papillantha** Schumann; **Hoya lactea** S. Moore; **Hoya oligotricha** ssp **tenuipes** K.Hill.

Hoya australis ssp. **rupicola**, K. Hill

Hoya australis ssp. **sanae**, (Bailey) K. Hill

Hoya australis ssp. oramicola, Forster and Liddle

An easy way to keep the differences between subspecies in mind is to picture the progression of **Hoya australis** from a moisture loving, rain forest plant (ssp. **tenuipes**) to the drought tolerant succulent plant ssp. **rupicola** as it progressed into drier, harsher terrain. **H. australis** ssp **tenuipes** has relatively thin leaves and delicate stems. **H. australis** ssp. **australis** would be the first step in this transition, having thicker, tougher leaves and stems. **H. australis** ssp. **sanae** has yet thicker, more succulent leaves and a more compact habit. **H. australis** ssp. **oramicola** verges on being a true succulent. with thick, heavy leaves but yet with a twining habit.



Figue 3: L-R H. australis ssp. tenuipes, ssp. australis, ssp. sanae and ssp. oramicola

Hoya australis ssp. **rupicola** would be the final step, a true succulent plant with thick stems and very fat, hard leaves placed close together at the stem tips. It is highly unlikely that the plants did progress in this neat fashion, one superseding the other as it moved into harsher environments, but a similar transition probably took place for ssp. **rupicola**.

Here are some brief descriptions of typical plants of these 5 subspecies:

H. australis ssp. **tenuipies**: This ssp. is always glabrous (leaves and stems hairless). The umbel (flower cluster) is loose and has clear white, starry flowers. The flowers are smaller and the pedicels thinner than ssp. australis. It comes from a moister environment than the other ssp. Flowers heaviest September to October in Australia, spring in the northern hemisphere.

H. australis ssp.**australis**: Can be glabrous or pubescent (leaves covered with fine hair), the umbel is a tight collection of flowers that can be relatively small or large. Most specimens in cultivation are probably of this ssp. It is quite variable, with many different leaf forms. Flowers heaviest March to May in Australia, fall/winter in the northern hemisphere.

H. australis ssp. **sanae:** pubescence varies but is always pubescent to some degree. This ssp. is more xerophytic (adapted to growing under dryer conditions) than the two above, but still viney. It has small quilted leaves that have recurved edges. Flowers May to July in Australia. It occurs on sand near the beach in Australia.

H. australis ssp.**oramicola:** Mostly glabrous with medium size flowers, has bright green, more succulent leaves than sanae. It twines, and is not bush-like, it has thick quilted leaves. Flowers January to March in Australia where it occurs on red laterite soils (The soil produced by the decomposition of underlying rocks).

H. australis ssp. **rupicola**: Densly pubescent to glabrous, very succulent leaves, leaf edges not strongly recurved as in ssp. oramicola or ssp. sanae. It is very xerophytic, and could be classified as a true succulent. The leaves are very thick and smooth, with no quilting. This subspecies along with ssp. **oramicola** has a slightly different floral structure than the first three, with short corolla lobes and calyx lobes visible from above between the sinuses. Flowers January to March in Australia where it occurs on sandstone.

These 3 photos by Ann Wayman (L) A surprise flowering of H. ssp. australis with pink splashes on the petals. (Center) H. ssp. australis foliage. (R) A typical H. australis flower.

Figue 4: Distribution map for A: ssp. australis, B: ssp. tenuipes, C: ssp. sanae, D: ssp oramicola, E: ssp. rupicola. The areas for each subspecies are approximate, intended to show the general distribution area. Most Australian plant colonies occur near or on the coast.

In order to try and lessen the confusion that often surrounds **H. australis** ssp. **tenuipes** and **H. australis** ssp. **australis,** it should be noted that there are two (at least) schools of thought on the matter. One position suggests that the plant described above as ssp. **tenuipes** should be described as ssp. **australis** and vice-versa. In this case the researchers recognize the different subspecies and differ only on the point of these two subspecies names. The groups of plants representing each subspecies are well established.

DISTRIBUTION- All ssp. of **H. australis** are found naturally occuring on the Australian continent.

H. australis ssp. **australis** occurs along the northeastern coast of Australia, in Papua New Guinea, Indonesia and Melanesia. This subspecies occurs in a wide variety of environments, from dry, rocky outcrops to open forest and vine thickets. This is the most widespread and varied of the lot.

H. australis ssp. **tenuipes** is also found on the northeastern coast of Australia in Queensland, as well as New Guinea, The Solomon Islands and Melanesia. This subspecies is found in relatively moist areas of forest or mangrove swamps.

Figure 5: Cutting of H. ssp. rupicola. Note the very thick, succulent leaves and stem.

H. australis ssp. **sanae** is found only in vine thickets on white sand dunes near the beach in Queensland and some nearby offshore Islands.

H. australis ssp. **oramicola** occurs only on two islands, Melville and Bathhurstt, off the northern coast of the Northern Territory near Darwin, in vine thickets on red laterite.

H. australis ssp. **rupicola** occurs near Kimberly Plateau, on Western Australia's northern shore, as well as the coast of the Northern Territory. It is found primarily on dry, exposed limestone outcrops.

CULTIVARS/FORMS/HYBRIDS: There are many varieties of ssp. australis. Here are some of the most well known.

cv. `Brookfield`, is a variety of **H. australis** ssp **australis** with bronze new growth and larger flowers. It is sold by David Liddle from his Australian nursery.

cv. `Mrs. G`, is distributed in America by a few dealers. It was published by Carol Noel, and is said by her to have a more compact and floriferous habit. A clone of the **H. australis** complex.

cv. `Lisa`, is a lovely variegated form with pink, yellow and several shades of green in complex patterns. New growth is often tinged purple. A sport of the **H. australis** complex. Very new to cultivation and hard to find.

cv. `variegata`, there are at least 3 variegated clones of the **H. australis** complex in cultivation, all are beautiful, all are fairly easy to grow.

H. australis ssp. **australis** from Kapoho, with huge leaves and good flowering habit is sold by Aloha Hoya Nursery in Hawaii.

H. australis `Tonga` (listed also as H. ssp. tonga) is another large leaved form with large flowers. Sold by Ted Green at www.rare hoyas.com-catalog.

There are many natural varietions in the **H. australis** complex. Leaf shades ranging from very dark green to pale olive to shades of yellow-green. Leaves may be small 1"x1" (2.54 cm. x 2.54 cm.) to large 9"x6" (23cm.x16cm.), and may be glabrous (hairless) or covered with fine hairs. Flowers vary somewhat less, ranging in size from ½" (1.27cm.) to nearly 1" (2.54cm.) and almost always white with a stain of carmine under the corona. The carmine color is usually reduced on ssp. **tenuipes**. Some clones display more carmine markings on the corolla petals, a very few show a degree of pink blush on the corona.

There are hybrids of **H. australis** and **H.subcalva** (syn. BSI-1) which are represented by more than one clone. One offered by Aloha Hoyas was made by Ed Gilding. He was attempting to cross **H. australis** with **H. cembra** (syn. **H. odorata**) and attempted to add **H. subcalva** to the mix to encourage the embryo to develop (distantly related hoyas such as **H. australis** and **H. cembra** do not cross easily, if at all). Judging from the resulting seedlings, however, he decided that **H. cembra** had not contributed to the hybrid. Another clone is offered by Ted Green, this one is named **Hoya** cv. `Pinkie`, and has been around for several decades. There have been speculations made by several experts that **Hoya naumanii** may be a naturally occuring hybrid of **H. australis** and **H. subcalva** as well. It was collected around 1980 on Gizo. **H. australis** and **H. subcalva** both occur in the area.

Figure 6: A hybrid of H. australis and H. subcalva....This photo is my own BSI-1 x australis, received from AlohaHoya.

Cultivation: The different subspecies of the **H. australis** complex are generally of easy culture, given a loose, well draining potting medium. This is particularly important with the more succulent plants represented by **H**. ssp. **sanae**, **H.** ssp. **oramicola**, and **H**. ssp. **rupicola**. All of these succulent type subspecies prefer almost full sun.

H. australis ssp. **tenuipes** can handle more water than the other subspecies due to its rain forest origin. It is probably the least appealing of the subspecies for cultivation owing to its close resemblance to some forms of ssp. **australis** combined with its less reliable flowering habit. Plants may often fail to bloom in spring and flowering is of shorter duration and less flowers than **H**. **australis** ssp. **australis**. I may be treated like **H.** ssp. **australis** as they have basically the same growth habit. They both prefer a warm locale with partial sun.

Figure 7: Cultivation techniques make a big difference in the appearance of the H. australis ssp. These two examples of H. ssp. oramicola were grown in very different conditions. The one on the left was grown as a succulent in bright light, with minimal water. The one on the right was grown as a tropical with partial sun , high humidity and abundant water.

H. australis ssp. **australis** is the most vigorous of the subspecies. It is strongly upright growing and does well on a three foot (.915M) to four foot (1.22M) trellis. Crossed bamboo U's in 4 foot (1.22M) lengths make a perfect support. Long tendrils are best left to attain several feet of growth above the apex (top) of the plant before being tied down, as it often slows growth when their growth points are lowered. It will also perform well as a hanging plant, although it will require more tending to keep the rampant growth confined to a reasonable space. **H.** ssp. **australis** requires moderate watering, preferring to dry slightly between waterings. Plants should not be kept moist at all times.**H.** ssp. **australis** will have a large flush of flowering in August/September in the northern hemisphere and continue to flower sporadically through January with adequate heat and light. **H.** ssp. **australis** can tolerate cooler conditions than most of the australis subspecies, with some clones tolerating temperatures into the 40's if kept fairly dry. It prefers full to partial sun.

H. ssp. **sanae** has a more restrained growth habit than H. ssp. australis, and this combined with its delicate appearing, smaller leaves makes it a good candidate for a hanging basket, though it will also twine on a trellis. It also prefers to dry between waterings and should be kept generally much dryer in winter. When it's kept very dry, the leaves will roll laterally nearly into tubes during the dry season. An adaptation to expose less of the leaf surface to the bright light of its native habitats dry season. Keep it warm and give it full to partial sun.

H. ssp. oramicola is slower growing than H. ssp. australis but can put out long, vigorous tendrils. These can be problematic, as the leaves are quite succulent and heavy. A smaller trellis is essential to keep this plant looking its best. H. ssp. oramicola also prefers to dry out similarly to H. ssp. sanae and should be kept much drier during the winter. A heavy clay pot is good for this plant, as it can become quite top-heavy especially in a plastic container. Keep the temperature over 59° Fahrenheit (15° Celsius), and give it almost full sun.

H. ssp. rupicola is the most challenging subspecies of the Hoya australis complex. The thick, heavy stems are difficult to root, tending to rot if not exposed to lots of soil oxygen. Careful attention must be paid to watering at all times. Plants should never be kept moist. Watering once a week for plants well established in their pots and growing well is sufficient. During dormant periods water may be required only once or twice a month. This subspecies also requires a heavy clay pot as the leaves are extremely thick and heavy and prone to tip over if not weighted. Full sun is a must for this subspecies and it prefers temperatures over 59° Fahrenheit (15° Celsius).

TRIVIA- Hoya **australis** can be toxic to cattle and certain other livestock if consumed in large quantities. According to Dr. Ross McKenzie in his 1993 paper "Australian Native Poisonous Plants", "(**Hoya australis**) growing in the softwood scrubs of Queensland has been used as drought fodder for cattle. To much will damage spinal function and the cattle will collapse and may die". I have found no reports of toxicity to humans or household pets.

There are many traditional remedies involving Hoya australis used by Pacific Islanders. In Fiji it is (was) used to treat swollen testicles and hemorrhoids. In Tonga and Samoa it was used to combat inflammation and convulsions.

Hoya australis uses a procedure known as Crassulacean Acid Metabolism (or CAM). In this process the plant closes its stomata (pores) during the day to reduce the water loss which occurs during transpiration. It opens its stomata at night to take in CO2 and release oxygen. Note- this dosen't mean that australis should be watered at night- it will take in water when it is available, and breathe on it's own schedule.

Hoya australis probably has several pollinators in habitat. One well documented one is **Ocybadistes walkeri,** usually grouped with butterflies although it is moth-like, and is diurnal. Birds pollinate clones of H. australis in David Liddle's Australian nursery, and in cultivation elsewhere it has been reportedly bee-pollinated. It's white flowers and heavy scent suggest that it may have a nocturnal pollinator, although these traits may have evolved to attract dawn or dusk-active species.

Last but not least, the fragrance of Hoya australis is arguably one of the best in the Genus. Not at all like honeysuckle, which it has been said to resemble, it is much less cloying and somehow heavier. It has the scent of cherry candy and ginger, with an undertone of chocolate.

Acknowledgments: My gratitude to David Liddle for his generous help in all aspects of this paper, and for his work in the field generally and specifically for his excellent paper **Variation in Hoya Australis R. BR. ex Trail**.

by Mark Randal San Francisco, 2006

Figure 8: Subspecies (L-R) H. ssp. australis, H. ssp. oramicola, H. ssp. sanae.

Old/New Hoya House in Vista, California

Back in 2001, Jerry and I decided to sell all of our hoya stock since we had discontinued the mail-order business and felt that 1,000 large hoyas were just too much to handle. So we sold them to a nurseryman in Pennsylvania, who came out, boxed them up and trucked them back to his nursery. For the past few years, the only hoyas we have offered to our walk-in customers were those we purchased wholesale. I've always loved hoyas, and missed having them around. So slowly I have started collecting them again, purchasing them, getting cuttings and plants off of our raffle table

In the same year (2001) we also sold all of our Christmas and Easter Cactus stock to the same nursery in Pennsylvania, so our little Easter Cactus greenhouse was empty. I decided to move all of my hoyas into the Easter Cactus house. The size of this house is 10' by 30', with the top covered in Plexiglass and the rest covered in netting. It's a little dark, but it stays warm in the summer, and in the winter I cover it in plastic so the temperature never gets below 50°Fahrenheit (10°Celsius). When I put the plants in the greenhouse last January, the plants looked very pale and hadn't been growing much. So I decided to begin a weekly vigil of fertilizing as I watered, using Miracle Grow liquid fertilizer. This method of fertilizing is really unique (and easy). It comes in a bottle and you screw it on the end of your water hose and turn the knob to `feed`. Everytime you water your plants, a little bit of this fertilizer goes into the pot. Within one week I began to notice a change in the plants. They were starting to perk up and looked healthy and green again. Within three weeks I noticed new growth appearing on just about every hoya. I can hardly wait to see and smell those glorious hoya flowers again. This is my `secret garden` seems I am hooked on hoyas again!

By Charles Everson

SOME NEW, and not so new HOYA STARS

It's been quite some time since I have gone through my greenhouse and really evaluated the growth and flowering qualities of the newer hoyas that I've collected in the past 5 years. These plants are not necessarily new to the trade but either new to me, or I've had them before and lost them or inadverdantly sold them before I had cuttings taken. I actually like to watch a plants progress through about 5 flowering periods before I make any snap judgements as to whether it can qualify as a favorite. One of my all time favorites and one that I've probably featured before is H. obscura, especially the bronze leaf variety whose foliage turns a beautiful mahogony color in the winter sun. This species is from the Philippines. Keep it warm and mist often to keep the humidity high. It requires a barely moist soil that is never allowed to dry out completely. It likes a lot of very bright light but no direct sunshine unless it's very early morning sun. I like to give it a few feedings of a good fish fertilizer early in the spring to give it a good start, then switch to a balanced formula of Peter's or Schultz brand fertilizer the rest of the summer. This species can have 15 to 20 umbels of 15 to 20 flowers open at once in each umbel. In my opinion the very light allspice fragrance of these flowers are one of the nicest of all the hoya species.

H. obscura Elmer ex Merrill ex Burton

Hoya siariae *Kloppenburg*

This hoya is quite new to my collection, acquiring it just a little over two years ago. It was originally collected in Tayabas, Quezon, Philippines, and published by Dale Kloppenburg. Named H. siariae in honor of Dr. Simoena Siar.

The first thing about this species that attracted my attention was the beautiful foliage. It is similar to many other Philippines species in that it has emerald green, lanceolate, glabrous foliage with 3 tri-ply parallel veins, good fast growth habit that quickly fills a 5 or 6 inch basket and seems to be a very good bloomer.

It formed 2 peduncles during its first year as a rooted cutting but the flowers failed to mature and all fell off. I expected it to be at least another year before I saw any flowers but was surprised when only 3 months later it started budding up again. This was just last summer! It proceeded to put on 4 more peduncles and together with the first 2, all bloomed, not just once but 3 times during last summer and fall. The flowers are rather small and cup shaped (much like H. campanulata), and are a gorgeous pink with pomegranate red corona.

Hoya siariae *Kloppenburg*

Photo by Eva-Karen Wiberg

Photo Gallery Descriptions

Top Row Left to Right

H. densifolia *Turczaninow*: This species has been around since 1848 and is a gorgeous relative from Java of the Philippine species H. cumingiana discovered in 1844. The foliage is similar to but with much larger leaves and spaced closer together. The flowers are also larger and it is a better bloomer. The stems are heavier and much sturdier than H. cumingiana. My opinion is that it is a clone that was either carried by natives to a new home and naturalized there or perhaps from seed. Who knows how almost identical species grow such a long distance from each other! It likes lots of very bright light to bloom, even some early morning sun, good air movement and should never be allowed to dry out completely. (Photo by Ann Wayman)

H. clemensiorum *Green*: The foliage of this species is without a doubt the most awesome of all the hoya species. The medium green leaves can reach 12" long. The darker green to purple veins are pinnate with each vein raised from the surface of the leaf leaving a flat depression in between with loops and whirls. This species is said to be in the H. finlaysonii complex and judging from the appearance of the flowers they may be, however the flowers on this species can last up to 6 days in perfect condition, whereby the H. finlaysonii complex flowers usually last no more than 24 to 48 hours. I like to keep this species barely moist, give it lots of indirect light and a weekly light feeding of a good balanced fertilizer during the summer months and it will bloom nine months out of the year. (Photo by Ann Wayman)

Center Row Left to Right

H. cv. Joy: This is one of the beautiful new hybrids, a cross between the species I know as H. fuscomarginata and a clone in the H. vericillata complex (H. sp. from Laos). When I first received this cutting it had the name H. metalica on it and that was a perfect description. In my greenhouse at night with no other lights on but a flashlight a thousand silver flecks become visable on the leaves...like each leaf was shot with tiny flecks of silver. As pretty as the leaves are the flowers are absolutely gorgeous, and YES they are that beautiful dark lilac color that shows up in the photo. This plant bloomed for me at about 18 months from a cutting and seems to bloom now at about 6 month intervals. It does require a lot of light to bloom and should be allowed to dry out a little between watering. (Photo by Ann Wayman)

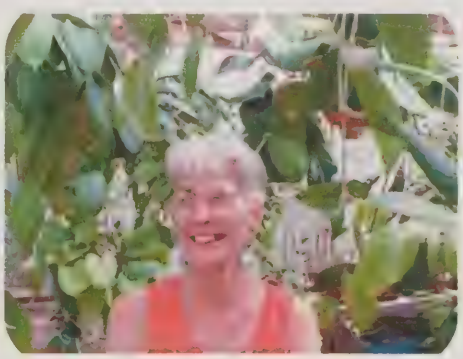
H. palawanica *Kloppenburg*: I received a cutting of this plant back in the mid 1990's and have literally seen this species with every label under the sun including H. bordenii, H. benguetensis, H. camphorifolia. Well, you get the picture! This is a markedly different leaf than the others mentioned above but since we don't identify species by the leaves but use them only as a guideline, The identification must come from careful study of the floral parts. I've looked at this thing under a microscope at least a dozen times over the years and have yet to come to any final conclusion as to what it is. I do know what it isn't! Until we can get an absolute agreement on it's identity, it will continue to carry the label of H. palawanica, at least in my nursery. (Photo by Ann Wayman)

Bottom Row Left to Right

H. blashernaezii *Kloppenburg*: Another of the beautiful Philippine species that display gorgeous vein patterns. The leaf stems are dark purple and the foliage turns dark maroon in the winter sun. The flowers are rather small, cup shaped and cream to yellow with a dark topaz yellow corona. I have had this plant since the mid 1990's and it has never bloomed for me, however, I sent a small plant of it home with Ann Strahm last summer and within two months received photos of this plant in bloom. (Photo by Ann Strahm)

H. bicolor *Kloppenburg*: I just received this species last summer but already it has grown into a beautifully shaped plant with dark, emerald green, leathery foliage. I don't expect to see it bloom this year, so will have to be content with Dr. Monina Siar's beautufl photo until I do. (Photo by Monina Siar)

Gallery Desc. by Ann Wayman



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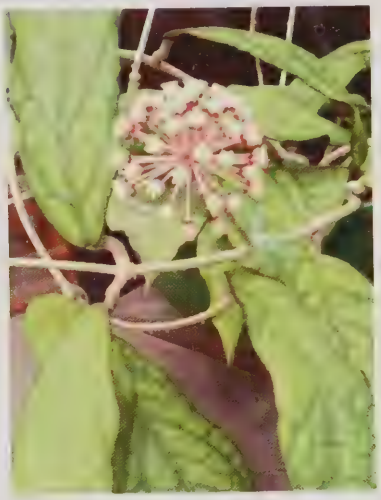

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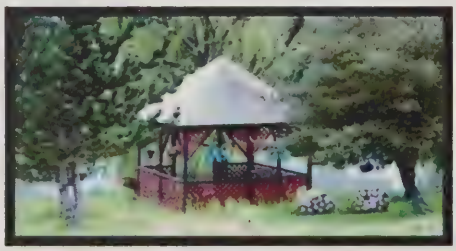

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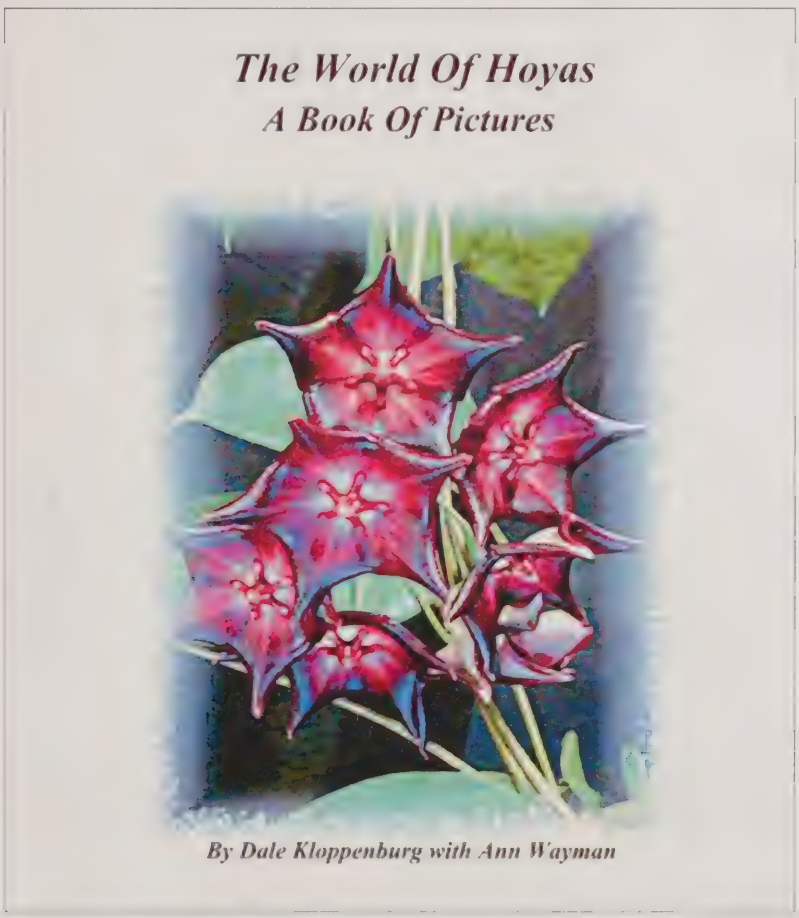

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Hoya vitellina *Blume*

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TABLE OF CONTENTS

Page .	Front Cover: Hoya vitellina Blume (Photo by Ann Wayman)	. . . . .
Page 2	Declaration/Masthead	. . . . .
Page 3	Table of Contents	. . . . .
Page 4	Cover Story Hoya vitellina Blume (by Ann Wayman)	. . . . .
Page 5-9	Identification of Hoyas (methods and material) (by Dale Kloppenburg)	. . . . .
Page 10-13	Notes & Confessions from a Beginner Part 11 (by Gerbrand Caspers)	. . . . .
Page 14-15	Where Have All The Hoyas Gone? (by Ted Green)	. . . . .
Page 16-17	H. imbricata on Palawan Island (by Ted Green)	. . . . .
Page 18-20	Chasing Hoyas on Gunung Arong (by Kim Yap)	. . . . .
Page 21	My Greenhouse (by Ann Wayman)	. . . . .
Page 22	Photo Gallery Descriptions (by Ann Wayman)	. . . . .
Page 23	Hoya Photo Gallery (Photo Layout & Photography by Ann Wayman)	. . . . .
Page 24-25	Advertising	. . . . .
Back Cover	Hoya vitellina (foliage & flowers) Photography by Ann Wayman)	. . . . .

OUR COVER STORY

HOYA vitellina *Blume* 1849

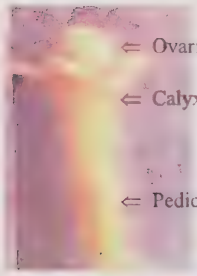
Hoya vitellina was collected in the mountains of western Java by C.L. Blume and published in 1849.

The dark green leaves are quite large and splashed with an irregular pattern of white, grey and very dark pink blotches. Being the first blooming (for me) in my greenhouse it is hard to say what kind of flowering plant this will be in the future. However, any hoya that is capable of putting out eight umbels with up to 25 flowers per umbel in its first flowering is fairly apt to remain a favorite in anybodys greenhouse.

I've seen these flowers described as "egg-yolk" yellow and they may be in some conditions, however, If I ever saw an egg-yolk the color of the flowers that were produced in my greenhouse, I don't think I would ever eat another egg. The crown or tiara that sits atop of the flower is pure white but the corolla or petals are brownish yellow radiating to a dark burnt umber on the lower portion of the tips. These petals did not reflex sharply at the tips but remained open almost flat, showing off the beautifully colored flowers.

There has been some controversy in hoya circles as to the true identity of Hoya vitellina. I grow both of the plants in question and wish I had an answer but the many descriptions of Hoya vitellina Blume from the 1800's (including the description of Blume himself) are so vague, that it would be impossible to pin down either one as an absolute certainty. These are some microphotographs taken by Dale Kloppenburg of the inner parts of the plant species shown in the cover photo

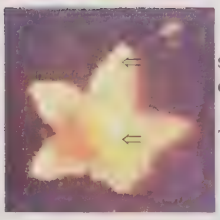
By Ann Wayman



⇐ Ovaries (or eggs that will be pollinated).

⇐ Calyx (or cup that holds the flowers).

⇐ Pedicel (or flower stem).



⇐ sepals (or the individual leaves of the calyx).

⇐ Top View of the ovaries.

A bottom view of the corona or crown. The tiara that sits at the very top of the flower. Notice the hollowed out portion in the center. This sits right over the ovaries and the entire structure is cradled inside the unopened corolla (or flower petals).

The bottom photo here is a fully opened flower showing a top view of the corona where a large part of the identification characteristics are found. In laymans terms, the corona lobes (petals) are fat and very fleshy, they're slightly cupped and have a hump (or umbo) on the inner half, just before it reaches the point in the center. The 5 brown specks that can be seen between each petal is the pollinia (or pollinating structure).

Identification of Hoyas

Methods and Materials

Excerpts from Malaysian Hoya Species

by Dale Kloppenburg

I have used a Swift binocular scope for most of my detailed work. It is equipped with a 10X and 30X lens. It is the 10X magnification that I use mostly on flower parts. I have an adapter for an SLR camera which fits over the eye piece allowing direct view of the subject through the camera and thus focal length can be adjusted easily. The 10X produces a final picture that is 16X due to the added focal length (distance from eyepiece to the film). I photograph the peduncle and rachis. Next I photograph the outside of the corolla to show the relationship of the calyx to the corolla and its sinuses. Then the calyx and pedicel is pulled free from the corolla and photographed in side view to show the surface of the pedicel, outer calyx and attached ovaries. Measurements of all these parts are made and structure noted. I then cut below the calyx with a razor blade and place the calyx face up for a photo of the inside (top view) of the calyx. Again measuring and noting overlap, cilia and ligules etc.

Next the flower is photographed from the top to show the relationships of the corona to the corolla (inner surface of flower). Next the corolla is separated from the corona, the ventral, (bottom, outside) of the corolla are photographed and corolla is flattened, often needing Kew solution, in order to flatten it to the slide. This process gives measurements for comparisons with outer flowers. Indumentum (any form of hairy covering or coating) is noted and any patterns of differential thickenings of the corolla tissue. The dorsal (inside) surface is then photographed. Next the corona (ventral and dorsal surfaces) bottom is photographed and finally the top. An individual scale is carefully removed using a fine sewing needle as a scalpel to cut down along the anther wings and photographed and measured. This process and the bending back of the inner coronal lobes reveals the stylar pentagonal table so it can be photographed and measured.

Finally the pollinarium are removed using the needle and placed in a drop of Kew solution on a slide. These I photograph with a Bausch and Lomb monocular scope. This scope has lenses of 40X, 100X and 400X. Unless I am looking for great detail or if the pollinarium is extremely large I use the 100X lens; and this yields a photo 165X on the film. It is necessary usually to remove a number of Pollinarium to find or maneuver one so that it lays face up and with the pollinia spread out rather naturally on the slide surface. There is a measuring guide on the slide.

Light sources: I work near a large picture window so there is a lot of light. I also focus a Tensor lamp onto the subject on the slide. I use the bulb function of the camera for an 8 second exposure on 200 ASA film (I prefer Agafa for its warm tone enhancements) on all binocular pictures (no bottom light). On the monocular scope I have the Tensor lamp shining up through the stage and subject and use only 1-2 second exposure. Films or prints are processed and scanned with a HP S20 (Photo Smart) scanner into the computer files under Word for Window.

Characters for Hoya Species Determinations

Foliage (Vegetative considerations):

In the genus Hoya the foliage and plant growth characters are highly variable and thus should be of benefit in delineation species. The vegetative characteristics that can be used in separating species are numerous. Consider the

following: Leaf size, shape, texture, positioning, margine type, venation, color, presence or absence of glands, internal cell structure. Take any one of these categories and see how the possibilities for separating species are multiplied. For example in leaf size (length and width ratios) hoya species range from very small, Hoya bilobata Schltr. or even small terete as in Hoya linearis Wallich to very large, the size of dinner plates as with Hoya loyceandrewsiana Green. In combinations with the other floral differences the possibilities will number in the hundreds. Until now no researcher it seems has studied the relative value of floral characters versus floral characters. In addition little research has been diverted to leaf internal cellular structural differences. Venation appears to be important, however keep in mind that the floral characters may override many foliar differences at least in some taxonomic classifications. Leaves vary much due to environmental conditions and this must be taken to account. Floral characters are much more stable.

Ted Green, Kaaawa, Hawaii has pointed out, that when species (mature plants) are grown in a single location (fairly uniform environments) each species, to a great extent, has an overall appearance, which is easy to recognize. Once familiar with this overall appearance, species can easily be recognized even when not in flower. In this regard, however, let us consider the work of Paul Forster and David Liddle in Australia "Variations in Hoya Australis R. Brown ex Trail" Austrobaileya 3/3:1991. These authors felt that the floral characters of 5 Australian species were so similar (within a reasonable range of variation, with no discontinuities) that they were grouped together as subspecies. These are: Hoya australis subsp. australis, subspecies oramicola, subsp. rupicola, subsp. sanae and subsp. tenuipes. "These taxa exhibit a wide range of vegetative forms but are relative uniform in terms of floral morphology". In this works floral continuity seemed paramount and floral characteristics were to a large extent disregarded. The foliage of these subspecies is vastly different in size shape, color, texture, leaf glands, and surface indumentum. There also is considerable amount of variation in the size and shape and other characters of the sepals, corolla and coronas and to some extent the pollinaria. Suffice it to say the authors did a lot of work and comparisons on this group and they feel the flower shape was consistent throughout. They overrode flower size, coronal lobe length and width and pollinarium length and width but felt there was a continuous variation present so a cline existed with some minor variances. No statistical analysis was presented.

Floral (reproductive considerations):

This brings us to what has been the primary way of delineating hoya species. Starting with the peduncle it has been recently pointed out by David Kleijn, Utrecht, The Netherlands "the shape of the peduncle is variable between species but rather consistent within species across environments, making it a character by which otherwise similar species may be separated when not in flower." This fact should be recognized but it is not infallible. Take the well-known long peduncled form in Hoya obscura Elmer ex Merrill ex Burton, among the many clones with shorter peduncles. I believe this points out fact that it is usually best to consider as many factors as possible that are present to aid in identification. The rachis is usually distinctive (species specific), possibly a more stable character then peduncle length (but usually not mentioned). In addition to the various shapes, there are present in some species basal pedicel bracts that are different for each species and finally there are differences in the origin of the pedicels from apically to fascicled. I think it also appropriate to continually keep in mind the possibility of misidentification of even well known species, that what we feel sure of may be incorrect. In addition I am sure you are all aware of the need for the study of as many clones of a species as possible to aid in the determination of possible clines where there is continuous variation present. It is necessary to see if the continuity is

continuous or broken. In some instances it will take much time to make definitive determinations. All possibilities, differences, and similarities should be taken into account.

There are numerous differences in the flower clusters (strictly speaking these are not umbels since in many cases the pedicels are of different length and do not necessarily arise from a common center). There are globose and semi globose clusters, all pedicels the same length. There are clusters with uneven pedicel lengths, convex, flat and concave and they can be dangling down (geotropic) pointed horizontally and also upright. In Hoya waymaniae Kloppenburg we have flower clusters on long peduncles that are vertical protruding through the debris cover of the forest floor (not in all cases).

First of all after the peduncle, are its attached pedicels supporting the individual flowers. To be considered is the length, diameter, surface, curvature or straight, enlarging toward the calyx or not, and color. Next is the calyx, important here is the size, shape, thickness and surfaces characteristics inside and out, its relationship to the corolla, overlap or not of the sepals, presence or absence of ligule like structures, their number and size and shape and any modifications. Possibly the cellular structure and vascular system. The ovaries, their conformation, surfaces (usually glabrous but some with hair cells), dimensions and germinal openings on top that should be noted. Possibly positioning and number of vascular bundles at the base ring and internally the ovule arrangement etc. are other considerations that might be noted.

Of increasing importance are the corolla, corona and pollinaria. With the corolla one should consider the size, surface textures inside and out, and their irregularities, the extent and type of lobe formation, color and its extent (although subject to environmental factors it is also genetic). Surface modifications such as thickenings and hair patterns, collar types, size and shape.

Next the corona offers a myriad of possibilities and evolutionary progression of this structure as with other structures needs intensive study. We need to be aware of the whole structure, as to size and positioning and its relationship to the underlying corolla. The relative absolute sizes, shape, length and thickness of the column and whether hairy, glabrous, etc. The same goes for the corona itself, including its depth and all feature modifications. The inner and outer lobe types and shapes (inner lobes can broadly be divided into two types, either spatulate or dentate) and including their relative positioning in relationship to each other and to the corolla. The lobes position to the anthers and the flower center and where it is attached to the anthers below. The dorsal surface structure including umbos, concavities, keels and side structure, sulcations etc. Modifications of the sides of the lobes, e.g. shelf-like projections and their magnitude, bilobed formations and their end character, sulcations or textures, absence or extent of thickness and shape. Note the under structure of these lobes, the side modifications, grooved or not and if grooved the extent of its progression toward the column. In addition these surfaces can be smooth or sulcate and the direction of sulcation should be noted. Normally there are two divisions here grooved or with a skirt and no groove as in Section Otostemma (Blume) Miquel. We now have two transitional species with both skirts, grooves and bilobes: Hoya myrmecopa Kleijn and Donklaar and Hoya kloppenburgii Green and also Hoya revoluta Wight. The authors of the former say "the flowers set this species well apart from other sections within the genus in combining characteristics of species from sections within the genus that differ markedly in flora morphology. To our knowledge H. myrmecopa is the only species that has both a convex negative geotropic umbel and bilobed coronal extensions. It seems the hoya genus is full of exceptions. In my opinion these two species bridge the gap between the Section Otostemma (Blume) Miquel and Section Acanthostemma (Blume) Kloppenburg.

Next for consideration is the type of anthers and their lengths relative to the inner coronal lobe, their breadth and the anther pocket structure. The anther wings which form the sides of the channel which leads to the stigmatic surface has a number of modification which should be noted, thick, thin, doubled, its projection or lack thereof beyond the sinus, and its depth and curvature.

A pentagonal stylar table, with differing dimensions and center structuring, occupies the center of the flower. The center sometimes as in Hoya darwinii Loher could be used as a species identification character alone. The stigmas are at the 5 corners are fused or divided at their upper surface and here is a raised template the shape of the retinaculum, that may guide the secretions from the stigma or stigmas.

I feel I have left the most important structure until last. This is the pollinarium, although not a visible character, but one that should be viewed with a high magnification scope, thus it has limitations. It is a structure, maybe the only structure, that seems most of the time to withstand long periods on herbarium material unchanged. Unless of course it is attack buy insects, or by fungus or carelessly preserved. Taken as a whole the pollinarium of each species is distinct. I have measured this structure from flowers bloomed in successive years and from different locations and have never observed any variation in measurements. This is contrary to some research findings, which have pointed to measurement variations in length and width of pollinia. In these cases I would say that maybe they should consider that they are dealing with different species. There are negative aspects to the study of pollinaria. In some instances they are difficult to remove intact. At other times they flip on the axis of the caudicle translator attachment. (This can be seen in Rintz's drawing of Hoya latifolia Don, Hoya elliptica Hooker and Hoya mitrata Kerr. and he is not the only one who seems to have glossed over this structure). The pollinia also in some species have a tendency to lay on the diagonal so the pellucid edge is obscured. Next it takes high power on a microscope to observe all details. (Here Rintz missed the short pellucid edge on Hoya darwinii Loher and Hoya mitrata Kerr). Since the structure is 3 dimensional it is necessary to focus up and down to observe all the ramifications.

This structure is made up of the following parts: the pollinia (structure which holds the individual pollen grains) with its pellucid edge and a vacuole (or area void of pollen grains) in from that (on most species), a basil side orifice for the intake of fluids needed for germination of the pollen grains. The structure easily dries out and shrivels when exposed to heat from a microscope lamp. These pollinia are formed first before the translators and caudicles are secreted by the stigmas and even before the secretions of the retinaculum is complete. The pollinia are held at their base by a (usually) clear sticky bulbous end of the caudicle. This structure differs in size and length of its head and tail among species. It is supported by the translators that are more structured are mostly wedge shaped with a slightly concave top which supports the more fluid caudicles. Both these structures narrow to tails as they enter the side channels of the retinaculum and are attached one above the other to the inside central wall of the channels (inside the retinaculum). These two structures along with the central retinaculum have great diversity in shape, structure and form. Since the pollinarium of each species is so specific and complex they give us very many distinct possibilities for species identification. The retinacula are widely different in different species, with many parts forming distinct structural entities that should not be overlooked.

It seems that with all the above-enumerated characteristics of hoyas at out fingertips it should be easy to determine a species. When we collect a new plant our first process is to determine if it has been previously been described. This is usually not an easy task, as we need to study the type plant in some herbarium (it could be anywhere in the

world's herbaria). We do not always know for sure if the type even exists and secondly must trace down where and if it exists. If we can not find herbarium material we search the literature to see if there seems to be a match. What we find is that many of the early descriptions are so incomplete that being sure of an identification by this means alone, is almost impossible. We can look at subsequent descriptions and here we may find conflicting data and in some cases descriptions that are of some other species. Lastly the places of origin are often incorrect and some cases exist, of actual falsification. Even drawings in Curtis Botanical Magazine and Fleur des Serries can be entirely wrong, mislabeled as with Hoya fraterna Blume, and this is not the only one. With diligence and perseverance we may arrive at a correct determination and possibly a consciences. I have observed that a taxonomist who is prone to lump similar species together looks at hoyas and sees all the similarities and believes that there are intermediates between any differences they note. Those taxonomists who look at species and see all the differences tend to disregard any continuous variations that may exist as too extreme to exemplify continuity. Genetic studies of seedling populations should determine just what variations exist and to what extent differences can be attributed to variations observed. With biological entities there is usually an expanded middle group with diverging ends. Most species fall into a large central group and from there spread out (morphographically, biologically, structurally etc.) to singular unique species on the peripheries. This is usually thought of as a sign wave in two dimensional views, or as a dome in spatial view. We should always keep in mind the factor of time, however, for with time comes change, often in small increments but occasionally by catastrophic proportions. In this regard species with wide geographic distribution and clonal attributes finally become isolated, change with time and the result is new species.

By Dale Kloppenburg

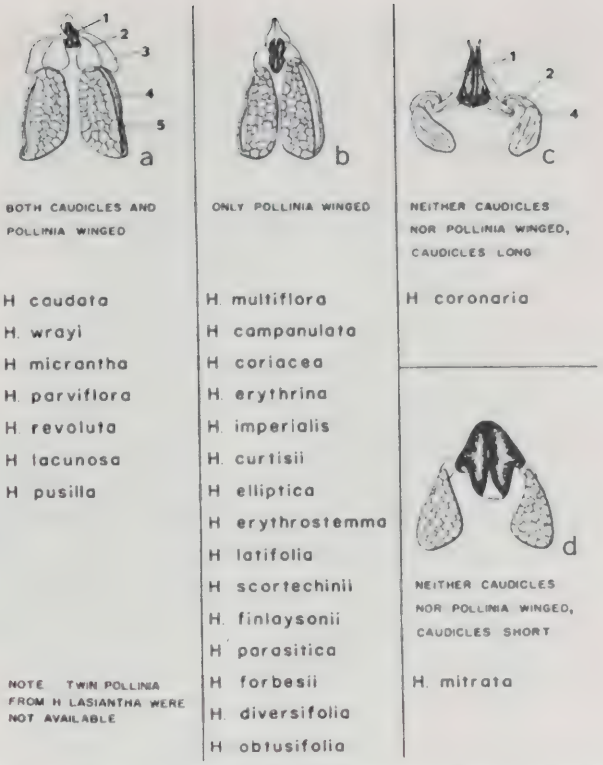


Fig 3. The 4 types of twin-pollinia found in Malayan *Hoya* species 1) corpuscle 2) caudicle, 3) caudicle wing, 4) pollinium, 5) pollinium wing

Some Pollinia Characteristics as drawn by Dr. R.L. Rintz

Botanical Terms Chart

Terms chart for foliage characteristics

CONSIDERATIONS, CONFESSIONS and NOTES from A BEGINNER: PART 11

(thoughts about rooting and potting)

Being a member means taking part and taking part is to attribute, something, anything no matter how trivial. The following triviality may be of some help to beginners like myself or maybe put a smile on the faces of the old foxes. Or you can just ignore it and go on enjoying the rest of the magazine.

When I began to grow my hoyas from cuttings I started as many plant growers do, with ordinary potting soil. As long as H. carnosa and pubicalyx were concerned I encountered no problems, they will grow and flower in anything from "cowdung to concrete".

Later after I had read some and acquired (a beginning of) "Knowledge and Understanding" I found out that very open and easy water draining qualities where eminent epiphytic and hoya soil requirements. Wettish but not too wet, (not for too long), dryish but not bone-dry. AND "hoya are not cacti" and, "hoyas like to have a period of drying somewhat after each watering".

Some hoyas like it hot, some like it cool. Some like it wet some even wetter and some are the of the dryish type. But the drying-up thing is in literature (for what I was able to find and read) an accepted thing (a fact).

Common sense made me also reflect on what hoyas endure in nature. In many (most ?) cases bound to a little crevice in a tree they would receive the occasional shower. They must be and are designed to make clever and economical use of water and thus are capable and probably need to dry up for shorter or longer periods in between.

I used to root my cuttings (all carnosa beginners work) in water, so did my grandmother. This proved mostly successful for me except in winter. Later, other hoyas showed not so easy to root in water. I tried them in plastic containers, claypots, in soil and in sand.

Although the plastic containers are greatly promoted I was reluctant to use them. "Gardening is done in claypots". I wear cotton or woolen clothing, never synthetic. But on the other hand I do mow the lawn with a motor ! I am, according to my children an old-fashioned but sometimes opportunistic old grump.

I usually stick to proven ways until I am totally convinced a new method is better: "Evidence Based or by way of Best Practice". These simple principals worked OK for me over the years, were academically bred into me and served me and my patients well for over 25 years.

The claypots having the advantage of drying the soil up more natural then the plastic ones. But, the plastic ones having more humidity preserving qualities.

Putting a plastic bag on the small claypots I used for rooting and initial potting showed an increased capability of controlling evaporation in the early phases of hoyalife. Cuttings seemed to me, to do better and rooted faster in clay than in plastic pots.

Soil improvement also made my successes higher. I started with putting a layer of hydro culture grains or simply smashed potsherds in the bottom of the pot and mixed the standard potting soil with: A) Cat Litter (believe it or not, I read somewhere that this was a golden and cheap way to absorb surplus water), and for preserving a certain amount of moisture.

NO GOOD! It made a cluttered mess and a horrible sight. The man who wrote this should be punished severely.

B) Peat, coco peat, wood chips and small stone grit. Practically the same recipe but without the stone-grit is sold as Orchid potting soil but someone is becoming filthy rich as it is sold at rip off prices by the pound in every garden center. The ingredients costing only pennies.

The pine wood chips, however, gave me an important clue. I noticed that in some cases the cuttings made very strong new root contacts on the wood chips and when they did they seldom attached on anything else (when removed from the pot). This is after some simple consideration of the natural way for hoyas and other epiphytic plants to grow, as an example: to attach themselves to their host and live by what comes their way in their crevice. I noticed the same rooting behavior in my Epiphyllums when newly formed roots attach themselves from downwards up firmly on the rough inside of the clay pot.

My hoya soil mix ingredients now (depending on what is at hand or available) are home-made: garden compost mixed with plenty of pine woodchips. I add peat and peat moss plus vermiculite to improve permeability. Vermiculite is great stuff and a great soil enhancer. My tomatoes grow very well on it too. Enough has been said and written about hoya mixes.

In the meantime I seemed to have more problems with rooting some other species of hoyas: calistophylla, deykei, finlaysonii, lambii, waymaniae. More difficult or just (bad) luck ?

I now start these with the "Growing-plug" method. These plugs must be a great invention as they are widely in use by professional growers, but have in my experience one great flaw. In colder times (spring) they stay too wet for too long. I use them on a heating mat nowadays. My rate of success has gone up dramatically ever since.

As a beginner I would have loved a general "Hoya-Index". An indicator for water and warmth-need, and maybe other specifics like rooting hints, details, beginners, advanced, easy or difficult etc.. for all the hoyas. There is nothing like that to my knowledge. Would it be helpful or even possible? Maybe a rough sketch for the individual hoya families.

Not going into detail of hoya families and classification (my knowledge is expanding but I am only in grade "1" of the "Hoya School of Learning"(this is a beginners confession after all)! Some of these cuttings (I bought and paid good money for) were obviously not doing well considering their more and more yellowing leaves. I decided to start anew with these. Removing them from the plugs and just following (my) common sense I wrapped the pitiful remainders in sphagnum moss and put them in woodchip filled claypots (plastic bags wrapped around them) and just sprayed very lightly for some weeks just keeping the moss and woodchips damp and warm.

Even after the yellow and dessicated leaves had fallen from these cuttings, they still showed (after a while) a remarkable drive for survival. Some succeeded in forming roots even after 3 months of hoya-hardship

This is a tale of my journey (so far) through the world of hoya upbringing. Why this confession and revelations of near-failure, beginners luck, stupidity and some common sense? Maybe some (future) fellow newby or maybe some oldtimer and accomplished grower will benefit from the following.

Recently someone offered hoya cuttings rooted on clay-grains (Seramis). Being of the curious type I dug into the phenomenon of Seramis. To my astonishment my local garden center has a Seramis counter. I must have passed-by on numerous occasions. We have a saying in Dutch, "what the farmer doesn't know he doesn't eat".

Red, fired claygrains is the simplest description. The same material claypots are made off. Highly water absorbent, leaving the container environment damp but not wet and thus able to act as water storage. It has been proven possible to root (hoya)cuttings in plain Seramis (substrateless). I think in non European countries other makes of similar products will be for sale.

This product is being promoted to keep (all) your plants at very low maintenance. After repotting in this medium, watering is (said to be) neccerary only once every three weeks (but in a closed pot system).

What made the big difference to me was the following contribution, I saw a professional hoya grower use plastic 14 cm hanging containers for all his hoyas (even the biggest ones) and saw the benefits of saving lots of room storing them hanging on different levels I made the change in thinking.

I have not unlimited space. I do want to grow and collect more (and more) hoya's. I dream of heavenly, huge, king-size warmed and insulated greenhouses. But I too have limited funds, a wife, 3 sons and 2 granddaughters. Holiday and weekend obligations to them all and myself. Work (for some years to come.) The rest of the house and the garden and some more hobbies, sports and fields of interest. And I think I am not a special case.

But with my experiment I think I found a simple and clever way to keep, grow and store hoyas AND have the advantages of combining plastic AND clay containers AND lower watering sequence (+ no more nightmares of helpful but overwatering neighbours ruining my Hoyas). AND save space AND have a reliable watering system.

For instance when repotting or checking unhealthy or poorly growing new hoyas, I noticed that in some pots the soil at the bottom stayed much too dry. Too afraid to overwater (remember I am talking of beginners problems, this is not an issue for the more advanced growers, of course.....)

The following photographs will show you how I made it work for me. The green thing is not an unidentified species but a piece of silly garden shrub imitating a hoya. I decided that destroying a perfectly usable container was enough of a sacrifice for the right cause.

The rooted plant placed within the soil mix is put into the 13 cm. container, surrounded and covered lightly by the clay-grains on a bed of woodchips, some gravel and peatmoss. I water until the water is pouring out from the openings in the bottom of the plastic container. Even in very hot and dry air conditions, like we had this summer, it has proven to be enough water supply for about one week. You can buy watering indicators with this system but there is really no need to. When the grains dry up you can easily tell by the change in colour. They develop a dull dry appearance. I let them remain dry for a few days after the top layer has turned dry and then water again. As said, in warm days this is on an approximate weekly basis.

Again, being the inquistive type, I tested the water absorbing capability of these clay grains. I found that 1000 grams (1 kg.) measures approx. 1000 cc (1liter) and will absorb about 550 cc of water. So it will hold more than half its weight or volume in water.

I have the strong impression that my plants do very well, "feeling at home" so to speak and forming lots of healthy leaves and vines. I just add a 2 weekly nutrient addition in the growing and flowering season. Just the cheapest product. I buy 1 gallon containers in a discount store, so nothing academic.

I made from a plastic container with the bottom cut out a little device to separate the Seramis

from the soil when repotting the plant into the hanging container. Next, from a plastic bottle I've simply cut an oblique piece of the top to create a simple device to poor the grains without spilling too much, into the space created between the container and the spacer-container which is of course removed after potting. The grains are longtime re-useable.

I hang my containers with self-made hooks bent from stiff wire in different lengths on 2,5 cm central heating tubes (cheap and rustfree). In this way I am able to store and display many plants on different levels in a limited space.

Maybe I will show you in a next contribution what has become of my hoya collection after my first year in "Heavenly Hoyaland".

Greetings to you all,

Gerbrand Caspers (Netherlands)

PS: since I wrote this article one year ago, I must add that I changed the fertilizer diet after the recent publications and recomendations from Mark Randal on the "Waxplant the Hoya Forum". I produced an abundance of beautiful, green and very large leaves, but the flowering .....And I send a picture along of part of my hoya collection in the new greehouse. To my wifes gratitude I have moved all of my plants out of the house now.

by Gerbrand Caspers

WHERE HAVE ALL THE HOYAS GONE?

On this last trip (March 2007) to Palawan Island, in the Philippines, I was amazed at the changes that have occurred there over the past 14 years. And it isn't all my fading memory and dwindling eyesight!

I have made 4 collecting trips to Palawan, from October 1993 (with David and Odette Cuming) to March 2007 (with my wife, Dorothy, Carol Noel and Anne and Rudy Bachmann) always with other plant nuts, and I have always been excited about what I might find. I first hit upon Palawan for it practically sits on a deflection of the Wallace Line and the Huxley Line and might show the differences or relationships between the Hoyas of the Philippines and nearby Borneo. Palawan is only 75 miles from Sabah, Borneo.

One difference is the lack of **Hoya imbricata** in Sabah and yet so common on Palawan and by contrast, finding **Hoya monetteae** in both places (Quezon, Palawan and Sukau, Sabah). Also, **H. diversifolia**, **H. coriacea** and **H. erythrostema** are found in both places.

Typhoons can do drastic things to shorelines, as the loss of big Kamani Trees (Calophyllum inophyllum) draped with **Dischidia imbricata** on Sabang Beach, at St. Paul's Bay. Both are now gone.

Extended dry seasons can eliminate plants that are not designed to weather 4 months without rain. Many Hoyas and Dischidias are true xerophytes and quickly recover but there are others that can't.

Slash and burn clearing for agriculture, housing or road building might destroy stations of certain species, as the loss of **D. major** on the road over the hills to Nagtaban.

Swamp filling for housing, as the Mangrove groves, where H. imperialis grows. North of Puerto Princesa (the capitol) near milepost K42, **H. imperialis** could not be found and yet it was not rare there 8 years ago.

Undetermined losses, without explanation, as the complete loss of **H. imperialis** from the Mangroves along the river at Sabang. Just 7 years ago, there were large plants with many seedlings coming up. I distinctly remember a large plant that had appeared and grew by the foot bridge – in just 2 years. This is where I found the yellow-pink form of imperialis, in 1993! They are all gone now and I don't believe that it was from overzealous collecting! Or, the several species of Hoyas and Dischidias from the river recreation area at Iwahig Prison. Where there were 6 -7 species before, we found only 3 now!

Serendipity collecting, at St. Paul's Bay where Colin Ridsdale from Leiden, found both **H. darwinii** and **H. curtisii**. I have never found them but then I think that Ridsdale collected just after violent storm that broke off the top branches and they were on the ground. A seldom seen occurrence. That put me within 100 feet of them and still they evaded me!

So, no matter what the reason, many hoyas are missing from Palawan – at least at the lower elevations. Since there are no public roads into the mountains, there might be Hoyas and Dischidias at higher elevations just waiting to be found.

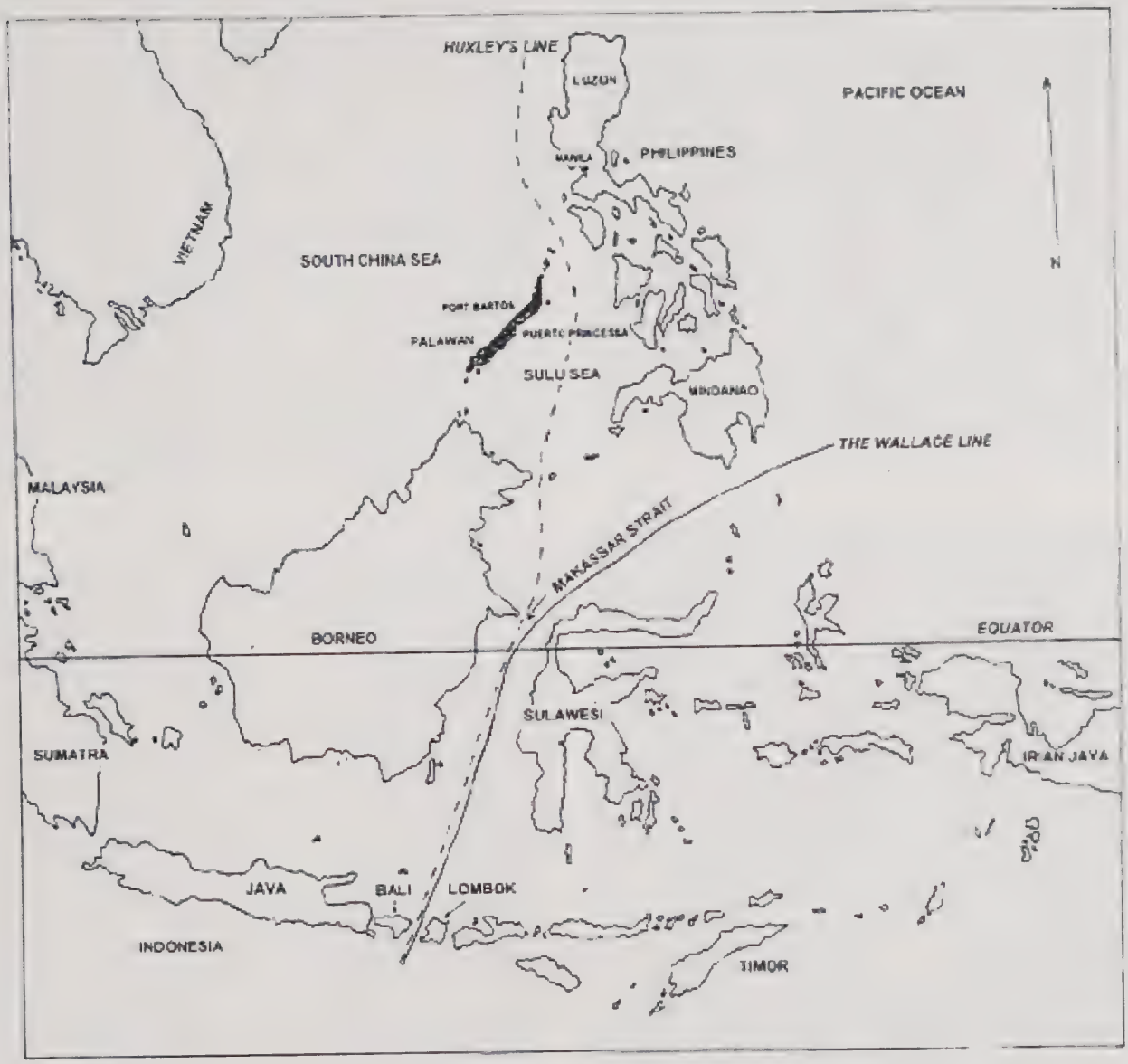
Tons of them, or so I dream.

Ted Green

Green: Plant Research

Kaaawa, Hawaii

Map showing Palawan and some of the many Islands in the Pacific where Hoyas are found



H. imbricata on Palawan Island

Dorothy's hand gives a scale for the size of the leaves.

Umbels of flowers on bare stems hanging from the tree.

HOYA IMBRICATA ALLEY

The commonest Hoya that I have found on Palawan Island in the Philippines is Hoya diversifolia but the second most common and by far the most interesting is Hoya imbricata.

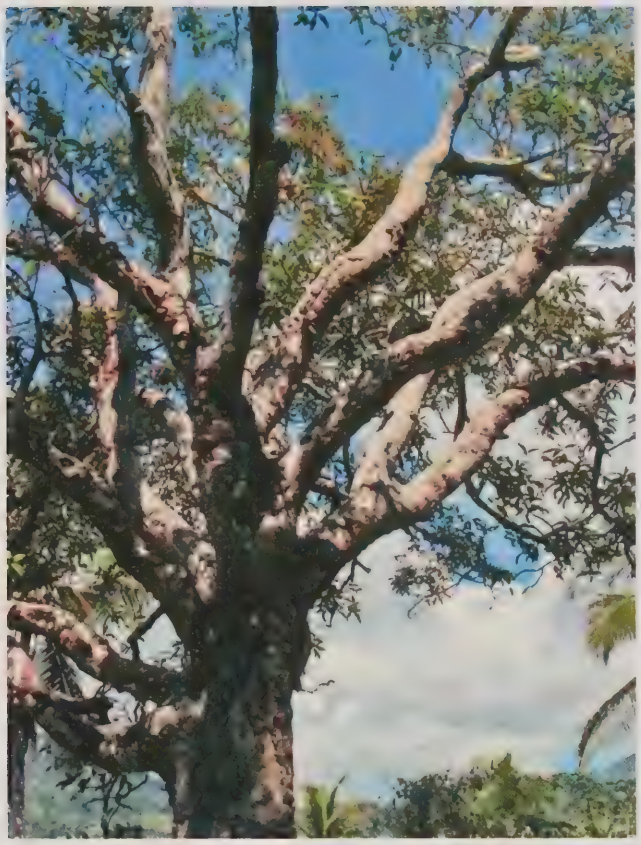
That is the hoya that has shell-like leaves that are closely pressed against the bark of the supporting tree. The leaves are arranged imbricate (shingle fashion), hence its name, and the adult leaves grow one above the other. Actually, 2 leaves are formed at each node as it forms but one leaf quickly aborts. The center of each 3" to 4" leaf is raised maybe 1/8 inch, and underneath provides a perfect home to stinging black ants.

Typically, H. imbricata grows on only 2 trees, the Monkey Pod (Saman) and the Mango, for reasons I don't know. Both have rough bark and both can provide up to 50% shade.

The normal temperature of Palawan is between 75 and 85, humidity about 75 % and the rainfall is seasonal, from 10 to 100 inches. In the rice-bowl area of Narra and Arborlan, south of the capital of Puerto Princesa, there is a dry period of about 4 months from January to April.

Closer to Puerto Princesa, is the Prison and Work farm of Iwahig. The inmates grow acres of rice and vegetables.

Within the prison ranch, is a recreational area along the river that is used by many locals in the area for swimming and picnicking. Tourists seldom go there, except for Ted Green, who has been there 4 times, looking for hoyas and orchids. The increased humidity along the river is a good place for epiphytes.



Along the road to the rec area, are about 50 old mango trees that have about had it, in fact some are nearly dead. This is the site of many H. imbricatas and should be named: **Hoya Imbricata Alley**.

The imbricatas found here are the ones with silver blotches (in contrast to the other form of all green) and the base color can be from a healthy green to red to yellow – depending on the amount of sunlight. It is obvious that all of the imbrictas are xerophytes and to see the true growth should be grown that way.

For growing, Hoya imbricatas I suggest attaching the plant to the bottom of a 12"length of 4" in diameter oak, tree fern or cork. No moss is necessary under the leaf or around the stem. Water it and let dry out between waterings. Decent light will produce flowering. Occasionally, use very weak fertilizer.

by Ted Green

Green: Plant Research

Kaaawa, Hawaii

Chasing Hoyas on Gunung Arong

It has taken a while to work up another head of steam. Let us go back to Tanjung Resang, Johor. Climbing the 200+ metres quartzite hill was no easy task for me. I had a 5-kg bag of digital tricks on my back. Balancing on the slippery steep slopes, with an unstable backpack, was no mean feat for a stiff-limbed, top-heavy old person. Nevertheless, I made it to the summit.

The picture above shows a tired Kimosabe with his arm around Naini, our local guide. Jessie, as usual, was trying hard to get into the act.

By the time KP and I arrived at the top, the rest of the group was finishing their packed lunch. Rested, we continued along the ridge, down, down, down to faraway Arong Bay.

I came upon the first flowering hoya when KP and I were nearing the top of the hill. The sight took me by surprise; it was so near the ground and growing out of the fork of a small tree. The small plant was in flower. Hoya multiflora Blume 1838 does not twine, climb and drape in profusion over tree branches. It has a compact bushy growth habit. This can clearly be seen in the habitat picture below.

The top picture shows the milkweed and the way it was growing in the natural habitat. The bottom picture is a close-up of the plant with 8 freshly-opened flowers.

Hoya multiflora is rare in the wilds of Johor, Peninsular Malaysia. A first collection was made a few years ago. Ayat, a nature person, came upon the small plant dying in the sun. It was growing from a hole of a logged tree. He rescued it and nursed it back to health.

While it is rare in the wild, it is not so commercially. Potted plants are available cheaply in most plant nurseries, worldwide. It has long been propagated vegetatively. The Shooting Star flowers are strangely pretty, blooms freely and are desired by growers everywhere. Even if it goes extinct in Nature, the species will live on and be cherished in homes and gardens and continue to be propagated and sold on the benches of plant nurseries.

I know of the existence of one other Hoya species living on Gunung Arong. It was discovered there a few years ago by Ayat and his friend.

Let us continue down hill. We heard excited shouting from a distance. They were the voices of Lee Wei and Peter, some distance ahead of us and a little way downhill. At the col where they stood was a sight to behold. Draping over stunted trees and creeping over the ground litter were masses of Hoya coronaria Blume 1826. We stood there and stared in awe at the rampant growth of flowering vines.

Earlier on in the essay, I mentioned that Hoya multiflora will continue to grow and prosper in cultivation. It will live on past extinction in the wild. There are many examples of this. Collecting plants should be permitted if done in a judicious manner and for a good purpose.

In making judgement, there is no absolute right or wrong. Between the thresholds of black and white are many shades of grey.

Kimosabe, December 15, 2006

My Greenhouse

A Haven of Rest or Just a Mess?

Many years ago when I began to grow hoyas I always envisioned a bright airy building full of windows and a clear glass or acrylic greenhouse roof. In my dream I always had a few hundred happily growing and blooming hoyas set neatly on benches with maybe a few more hanging happily over the benches. Of course in my dream, the windows were always clean as was the roof. My benches were spotless and I never had bugs. The floor was clean and the temperature and humidity was always perfect.

After struggling with an ever growing population of African Violets, Orchids and hoyas in a rather small flower shop for about nine years we sold our home in Klamath Falls, Oregon and moved 90 miles away to the Medford, Oregon area. I finally had my greenhouse, or rather a place (a huge place) to grow all the big hoyas I wanted. Well, it wasn't really a greenhouse, it was more of a truck repair shop. In fact it was a truck repair shop! A big, big building, all corrugated metal including the roof, no windows and the only heat was a huge pot-bellied wood burning stove. Oh, did I mention that it had a forty foot long by thirteen foot deep grease pit where the trucks drove over it so the repairmen could work under the bottom of the trucks. No running water.

The one thing it did have in abundance was heavy benches where huge hoists could lift the big motors out of the trucks and place them on the benches to be worked on. It really sounds like a nightmare but I knew that it would take very little work and money to get it in operation.

Since the entire front of the building was a giant swing-up door, we had to hire a carpenter to tear it all out and enclose the front of the building. I had him put in 4 windows and a steel door instead. Next came the roof. It all had to be torn off and we put up Ultra Violet safe Greenhouse acrylic.

Since it was almost winter by that time, my husband spent a lot of his spare time putting in insulation and covering the inner walls with waterproof sheeting. Come spring, he put in large stationary tubs and hot and cold water so I could wash pots and have warm water to water my plants. Next came a nice big swamp cooler and also a greenhouse grade furnace.

I couldn't think of even one thing that I needed in order to open up shop except I knew we had to close up the grease pit before someone fell in and broke their neck...probably me. Once again we had to hire carpenters to do that job but they knew exactly how to get it done and within a week I had a solid floor to walk on instead of having to walk a plank or jump over it.

Now all this sounds like it was so easy that no problems would ever rear their ugly heads but wouldn't you know that within a few months the mealie bugs had found my hoyas. I was always stepping on pots full of soil and dumping dirt all over the place which had to be swept up constantly, plus I brought aphid in from my rose garden outside. I ordered a large bunch of cuttings from someone and most of them arrived with spider mites and many of them escaped before I could get them treated and washed off. And my few hundred from my dream has multiplied into over a thousand plants because like everyone else who gets addicted to hoyas, I simply can't stop ordering new ones or throw away any pieces that break off. I had some photos of my greenhouse that I was going to publish with this article but after seeing Gerbrands beautiful "well kept" greenhouse, there is no way anyone is going to see mine. Ann Wayman

PHOTO GALLERY DESCRIPTIONS

Top Left

Hoya cystidiantha *Schlechter*. This species was originally collected and published by Carl Blume in 1849 as H. cystidianthas laurifolium. It was republished under several different names in the mid to late 1800's. I purchased it in 2005 as just Hoya cystiantha. It's a very pretty little shrub type plant that gets its new growth mostly from the roots. It doesn't seem to make vines. This is not a plant that I would suggest to new growers as it is rather hard to keep happy. The small flowers are light brown and very cup shaped.

Top Right

Hoya lobbii *Hooker f.* Discovered by Thomas Lobb in the Khasia Mountains of eastern India. Published in Flora of British India in 1883. This species is a true shrub. It doesn't climb, it doesn't vine but remains into maturity as an upright shrub that can get 3 feet tall. A well grown plant has beautiful dark green foliage with some silver splashes. The flowers are spectacular in that they are quite large, dark pink and have dark red coronas with a yellow center. I can't detect any fragrance. It did bloom at an early age.

Center Left

Hoya juannguoiana *Kloppenburg*. This tongue twister of a hoya name was named in honor of Juanne Guo. Not a hard hoya name to pronounce if you just say her name then add the iana which means "in honor of". By any name, it is gorgeous. Every part of this plant is pretty from the beautifully veined leaves to the flowers to the wonderful fragrance. It is also one of the best blooming plants that I own.

Center Right

Hoya myrmecopa *Kleijn & Van Donkelaar* This adorable little plant was collected by Ted Green and David Kleijn on the northwestern shore of Lake Poso in central Sulawesi in 1994. I had purchased a cutting from David Liddle last fall (2006) and expected a long wait before seeing any flowers from this one. It surprised me this spring with 1 umbel of 10 exquisite little flowers. I think I'm going to love it.

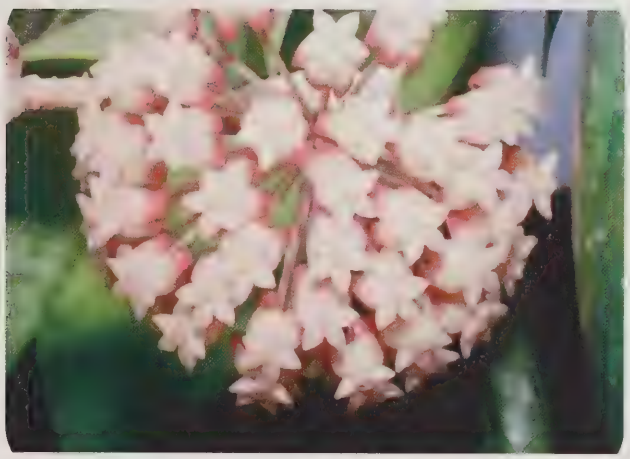
Bottom Left

Hoya villosa *Costantin*. Published in 1912 by J. Costantin. This species was described as villous (hairy) The entire plant is like plush velvet, especially the backs of the leaves. The stems, peduncles, calyx and the unopened flowers are also velvety. Once they are open, they are more waxy except on the backs of the petals, which remain velvety. Pure white except for a dark red stain under the corona. All this plus a wonderful spicy fragrance. They have been open for 10 days and are still perfect.

Bottom Right

Hoya litoralis *Schlechter*. I'm sure this species has been featured in our gallery before but it is such a wonderful little plant that it deserves a lot of recognition. It makes one of the very best basket plants with beautiful medium green, elliptic-lanceolate, fleshy leaves. The flowers are small but intricately beautiful. They also have the surprising ability to make noise when they open. You can often hear a muffled snap, crackle and pop when you have flowers opening.

Hoya Photo Gallery



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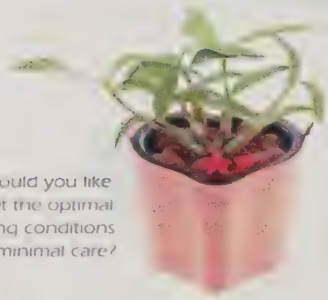

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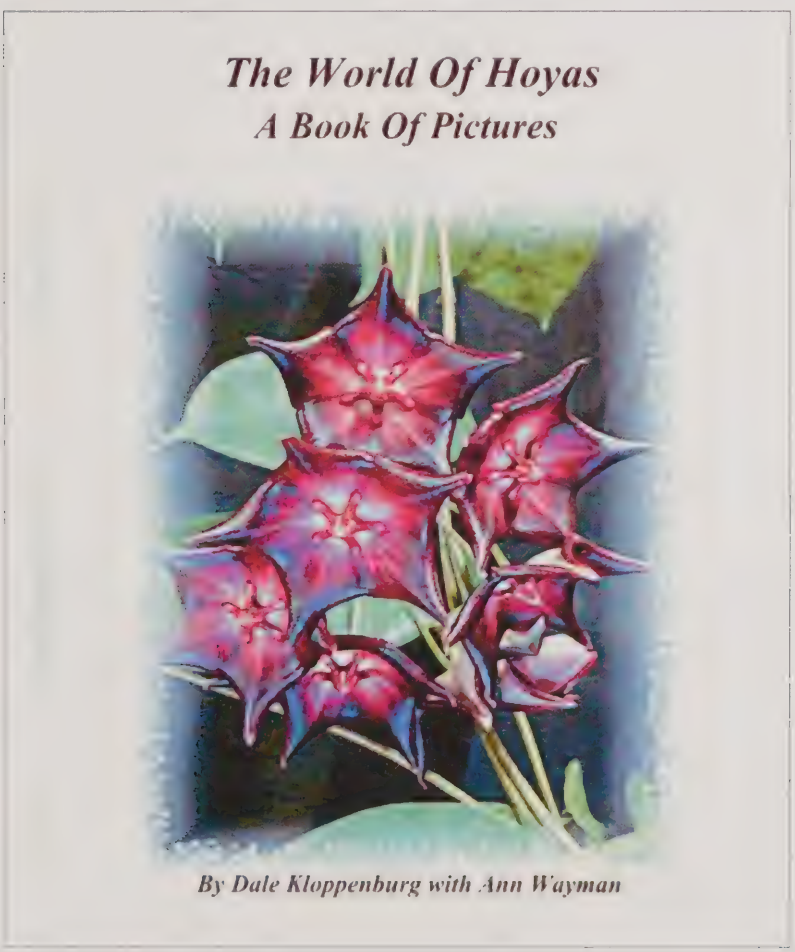
HOT! HOT! HOT!

Nothing like this has ever been attempted before! Dale Kloppenburg's wonderful text in "The World Of Hoyas" has been kept intact, while all the old black and white photocopies of herbarium sheets have been replaced with full page, full color photos of beautifully staged foliage shots with large photo insets of flower umbels that represent the particular species.

Some of the very best photographers in our organization have participated in the publishing of this book with many beautiful photographs, all labeled and correctly identified to the best of our knowledge.

If you have ever wondered what an entire plant, or even the leaves and growth pattern looks like when you see an especially beautiful umbel of hoya flowers, now is your chance. This beautiful book has been professionally bound in perfect binding with a semi-soft vinyl cover. contains 260 pages with several blank pages at the back for notes. Available now. Just $48.00 for the book plus $2.85 book rate postage in the U.S. Postage for global priority in Canada is $13.00 U.S. and overseas global priority postage is $19.00 U.S. Surface mail is also available and takes approximately 6 weeks.



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FRATERNA

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Hoya incurvula Schlechter

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Table Of Contents

Front Cover: Hoya incurvula Schlechter (Photo by Denise)

Page 2	Declaration/Masthead
Page 3	Table Of Contents
Page 4	H. incurvula text and Schlechter Drawings
Page 5	Our Cover Story by Ann Wayman (Photos by Tammy Caldwell)
Page 6,7	A Visit to the Hoya Collection at Leiden University (by Gerbrand Caspers)
Page 8,9	Photos taken at Leiden University greenhouse and grounds (by Gerbrand Caspers).
Page 10,11	Leaf Cuttings, Will they make new plants? by Ann Wayman
Page 12	Photo Gallery Descriptions (by Ann Wayman)
Page 13	Photo Gallery (Photo Layout by Ann Wayman)
Page 14	Odds N Ends
Page 15-17	Advertisements
Page 18	Hoya aldrichii by Ted Green

Incurvula Text & Drawing

Type description:

In Dr. Schlechter's Hoya Species (1993) 80-81. R. D. Kloppenburg. Hoya incurvula Schlechter. leaves outspread petiolate, ovate elliptic, obtuse, fleshy, glabrous, margins thickened below, 2.5-4 cm. long, above the middle 1.2-2 cm. wide, petiole fleshy, thick 3-5 mm. long; cymes shaped like umbels, multiflowered, peduncle about 3-4 cm. long, with the pedicels 5-12 mm. long, threadlike, glabrous, with the lobes of the calyx ovate obtuse, corolla recurved with the tips rolled up, flattened about 7 mm. in diameter, deeply 5 lobed, outside glabrous, lobes ovate acute, inside apex turned back, protected (concealed), with exceptional dense papilla; with the scale of the corona decurved, nearly oblong, above oval apiculate, lobes below scaly tongue like, apex (i.e. back) incurved obtuse, leaflet longitudinally extended nearly with the leaflets of the anthers distinct, apex over topping; with the pollinia obliquely oblong; translators small, retinaculum minute, narrowly rhomboid.Celebes: on trees in the forest at the foot of Lokon (Minahassa) about 800 meters altitude (R. Schlechter #20451 Type) flowering in Nov. 1909.

Related to *H. halophila* Schlechter and *H. intermedia* Schlechter recognized from the other species of Section Otostemma (Bl.) Miquel through the auricle of the corona scales bent inwards at the points.

References: Kloppenburg in The Asclepiadaceous Works of Schlechter (1992) 30 . Kloppenburg in Dr. Schlechter's hoya Species (1993) 80-81.

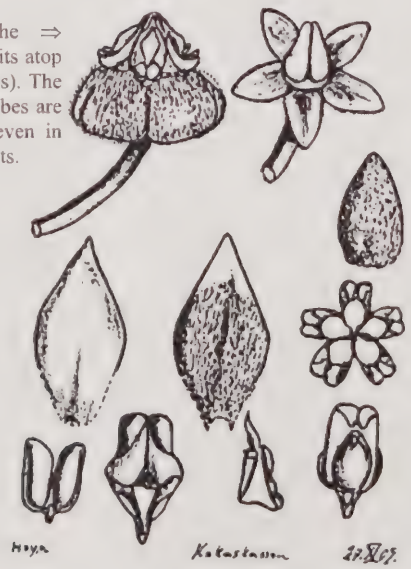
Note: This species does not conform to the Otostemma Section.

Hoya incurvula Schlechter

Sheet #20451 (B) 20 November 1909

Collected by Dr. Schlechter on Lokon River, Celebes

A top view of the ⇒ entire corona as it sits atop the corolla (or petals). The decurved coronal lobes are very easy to see, even in close up camera shots.



⇐ like a 2 pronged fork, the coronal lobes decurve inward toward the top center of the corona.

⇐ here a closer view of a single corona lobe curving inward toward the center.

Our Cover Story

Hoya incurvula Schlechter

There are a few of the smaller flowered hoyas that I consider really beautiful. This happens to be one of them. The very small ones are cute, adorable, darling, exquisite little jewels and other epithets that I attach to my hoyas. Of course there are those hobby growers (and more than a few nursery growers) who go "hog wild" over every hoya that opens even one umbel of flowers and it is understandable. I don't believe I have ever seen a hoya that I thought was ugly.
I received this species approximately five years ago in a shipment of unknown hoya species from Sulawesi...wouldn't you know every single one of them had a label that just said "unknown species from Sulawesi" Out of this batch of unknowns the folks who do research into the identification of this genus have finally identified all but a few and one was given a name and published as H. tomatoensis, because it was not able to be matched with anything we had. I still have one that I truly love and hopefully one day soon it can either be identified or given a name.

The cover photo was sent to me for identification by a friend on a hoya forum. I think her name was Denise but I can't remember her last name. The photo is so exceptionally good that I can actually see the incurved coronal lobes with the naked eye. The color on these flowers was a bit of a surprise as mine always blooms a rather off white with a lavender pink center. I assume it's because of the difference in growing methods or she may have a different clone than I have. For whatever reason, this bright pink is stunning.

The foliage on this species is also exceptional, and very distinctive. The small leaves are rather round and a dusty looking pea green. They cup under slightly like they're trying to hide something underneath. The name "incurvula has often been confused with the cupped habit of the leaves, however the leaves cup downward making them recurved rather than incurved. Grown on the wet side and in the shade, they elongate into rather long, paddle shaped leaves.

Photos below by Tammy Caldwell

A Visit to the Hoya collection in the Hortus Botanicus of Leiden University

As a part of the National Plants Collection the hoyas are located in the University Botanical Garden (the Hortus Botanicus) in Leiden, Netherlands. There are several old university gardens in the Netherlands, in Utrecht and Amsterdam but Leiden being the oldest The hoya collection consists mainly of the former Ruurd van Donkelaar collection.

Founded in 1590, in the times of the great discoveries and the VOC , this Hortus has through his gardens introduced newly discovered products like tomatoes, potatoes, maze and tobacco to the rest of Europe. The famous Swedish botanist Carl Linnaeus (born over 100 years later in 1707, visited its collections regularly). The oldest still living tree in the garden was planted in 1609.

After entering through the Palmhouse and through other collections I knocked on the doors of where I could see hoyas behind closed doors I noticed this part of the plant collections was not open to the public. The little sign WAS CLEAR "for research only" but having met the Hortolanus (headgardner greenhouses), Art Vogel on another occasion recently, while lecturing about his field trips to Borneo and making inventories of specific families of Orchids (his speciality), he happily opened the doors for me.

The overall impression of his years long experience visiting and collecting for the Hortus collections knowing and witnessing the mass destruction in a rapidly changing Borneo (and surely in many other places), has made him a very unhappy man. The organized mass destruction of the earths rainforests for still more short term profits from ever more palm-oil plantations. First the logging industry mobs sawed down millions of acres of trees and now the construction crews (or should I say destruction crews)? are moving in with plows and bulldozers. It's all very sad and also weird that so very much is legally destroyed while the CITES prohibits collecting and research in those Regions. So much lost forever!

"There are not that many interested in this part of the collections" , he continued, "but just the other day there had been two biologists busy for some time with research on the Hoyas". Tatyana Livshultz was working on Dischidia and Livia Wanntrop on Hoya's of Borneo.

I strolled through the two greenhouses at leasure and enjoyed the very neatly exhibited hoyas all in brown hanging containers. There was a (very) warm department kept year round at 20-25 C. (68° to 77° F.) but now in full sun it must have been over 35 C. (95° F.) and an automated misting system gave it a real rainforest feel. The building itself was built in the 1930's and though very well kept; it shows. Lots of old piping and hand controled window-openers. The structures are in good condition but the signs of age and wear are obvious. It keeps the Headgardner busy controling and managing the climate. Next to it an identical but somewhat cooler (14-20°C) (57-68°F.) department which houses also the Dischidia collection. I had no idea there where as many species as that. These very nice, mostly small to tiny Asclepiads, cousins of our hoyas are kept mounted on pressed coco fiber mats (5 x 5 x 40 cm) cut from plates (40 x 60 cm) and hanging from wire hooks. Because of the high humidity these mounts where overgrown with all kinds of moss and this gives a real natural and very pleasant look. I stopped counting but there are over a 100 different ones, at the least. Many without names but only IPPS/GPS and inventory numbers plus the discovery locations.There where also several hoyas mounted this way not only looking great but they thrived thus living real epiphytic lives. I spotted a nice H. caudata with

very dark red leaves, and a great looking H. waymanii and many other hoyas living like this (H. longifolia, H. tsangii (DS-70) H. lacunosa etc, and all in very fine condition. Watered thoroughly once a week and afterwards fed by spraying the leaves.

Living in very bright conditions here these hoyas showed a remarkable difference from mine and what I have seen in other collection. All plants have very thick succulent leaves and are much more bleak (yellowish) than mine. Also very few long runners, all compact plants with thick stems and only a few clusters of mostly withered leaves, here and there I saw some flowering. "They are cut back because of space limitations and to control them" Art Vogel told me. Also that most plants where rejuvenated some 5 years ago. Most older leaves were probably 4-5 years old and the contents of the containers mostly solid packed rootballs by now, I gather. Is it because of the high light intensity that these plants need and produce less chlorophyl (green) ? Or do they produce smaller amounts of it because they are in the same soil for so long and do not grow (as fast as mine) as a result of that. An interesting question!

Lots of plants, big old and even older Methusalems I know of, live for many years in the same pot, getting only (tap)water and no feed. They do not only "not die" but seem to live on forever and flower abundantly. The leaves looking just like the ones I see here.

Seeing here also a phenomenum that occurs on some of my plants; a black mottling (or spotting) of the leaves. It seems to do the plant no harm but is there a reason for anxiety?

Always seeking for the right and stable soil Art showed me a ready (professional) mix for Phaleonopsis (orchid) containing shredded bark particles (70%), coarse perlite (15%), shredded sphagnum moss and to my suprise, small particles of shredded polyethlene foam (the kind that is used furniture and mattresses) This last item keeps the mix loose and fast draining. It expands as it dries letting air and oxygen into the root system. Surely something to give a thought or two about. Added were also elements specific for Phaleonopsis Orchids etc.

My greatest surprise was that the collection is not that big. Many that I have read about and even own myself were missing from this collection. I think this collection has not grown but is still pretty much the van Donkelaar collection, mostly what Ruurd collected himself on location. The goals for Leiden are collection and storing the flowers and other parts of the specimens in jars of alcohol of which they now have many. Their goal does not seem to obtain the most "complete" hoya collection.

In some pots I saw small ants, (I perceived at least two different species not indigenous to our Lowlands) very busy, moving amid the flowers and then going underground in the containers. They must have hiked from exotic places along with these or other plants finding here conditions like "home, sweet home". Also from time to time a very exotic looking jumping spider glanced at me with more then two (pairs) of eyes.

On leaving I confessed to Art that I was glad I had left my scissors at home seeing so many desirable plants and he told me that due to International Agreements on Biodiversity the specimens (or parts of it) from Botanical Collections are not to leave the premises. An agreement to protect all collections from other then scientific goals. I left empty handed (but with a bag full of the orchid soil for experimenting). Content with many new ideas and gained knowledge. I wrote this little piece in the train traveling back to my own hoyas and the odd Dischidia (but that is going to change now)!

Gerbrand Caspers (Netherlands)

Hoya & Dischidia Greenhouse At Leiden University

Art Vogel

Headgardener Greenhouses

Giant Amazon Water Lily

Victoria amazonica

Leiden Photos continued from Pg. 8

Main aisle/Dischidias hanging in background

different view of greenhouse

Hoya obovata

Hoya excavata

Hoya caudata

Hoya waymanii/with round leaves

Leaf Cuttings

Will They Make New Plants

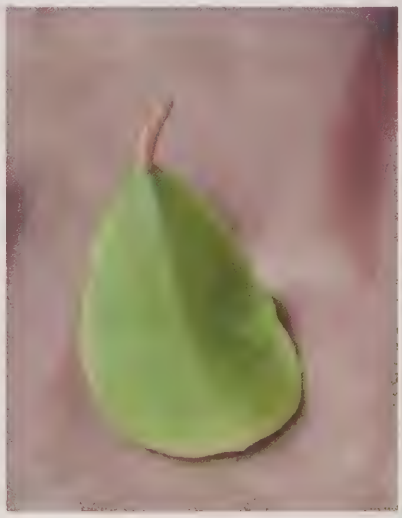
The term, leaf cuttings, mean different things to different people. Although many plant families have the ability to form new little plants directly from the stem or on the leaf surface itself, the Begonia and African Violet families are the more familiar to most of us. In those particular plant families a leaf cutting is just that...a single leaf and its stem. There is no need for a leaf node to be present in order to form little new plantlets that grow directly from the roots at the end of the stem, and in many families directly from the leaf veins if the leaf is laid flat on a moist surface.

Since we're discussing hoya cuttings, it's only fair to say that YES, single leaf cuttings of hoyas will root as fast and easy as a cutting with leaf nodes. The problem is that they seldom proceed to form plants. The leaf will continue to grow and sometimes increase to double its original size. They look green and healthy and I suppose if one has enough patience to wait, they might eventually make a plant.

As an experiment, I've kept them alive and growing for as long as 10 years with no sign of new plant growth. On the other hand, I've had plants that looked dead, and if I didn't get them removed from the pots but still sloshed a little water on them occassionally they have somehow rejuvinated and will form plants somewhere down among the roots and will resurface to grow into new healthy plants. Of course those are not considered leaf cuttings but just plants that grow out from the root system. When it comes to multiplying, plants seem to have a mind of their own.

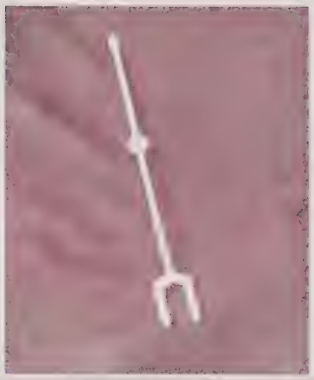
When we think of hoya cuttings, almost all of us picture a nice, healthy looking 6 to 10 inch stem with many leaves still attached..not too young and not too old but just right for propagating new plants. There are times and there are species of hoyas that just don't conform to our ideals of what makes a great cutting. Some hoyas have internodes that are as much as 14 to 16 inches apart. These species are usually the very beautiful H. archboldiana, H. megalaster, H. macgillivrayii, H. onychoides (many more that I can't think of at present).

Hoya cuttings can be manipulated to form roots in areas of the stem most people don't even know about or may even think it's impossible. I've taken a few photos of methods I use to make difficult cuttings root with ease.



This is a single leaf cutting of H. excavata, one the species with super long distances between internodes. As you can see from the photo, it is just a leaf with a stem, no leaf nodes. Apparently whether it makes a plant or not has to do with the DNA and/or RNA which all life on earth depends on to tell the cells what to do. A fascinating but extremely technical study that would no doubt bore our members into running the other direction.

Photos on next page will tell the story.



Handy Tools

Plastic place setting markers for parties. Remove center prong and smooth with sandpaper or heat slightly with cigarette lighter or match, then smooth lightly with fingers. Makes a wonderful tool for holding plants in the rooting mix, or turn it around and use to prop up your cutting to keep them from wobbling and breaking off new roots.

The top photo here is a 1 leaf cutting but it was cut in what I know as a mallet cut. It came from a 4 foot vine that had only this 1 leaf. Since we are dabbling in the DNA zone, it is necessary to have some part of the cells of the mother plant. I cut this very long vine on each side of the leaf. As you can see, I now have a nice, short, healthy cutting with some part of the mother plant attached. It will root in about 10 days and very possibly have a nice new plant growing within a month. The second photo is basically the same theory but has 2 leaves instead of 1 and will make a fuller plant faster as it has an extra node and will likely produce 2 plants instead of 1.

This bottom photo is what we usually think of as a typical hoya cutting. It has lots of leaves and they're close together. I would take off just the small leaf at the bottom , cut off the little dead end at the top and plant the cutting past the node where the bottom leaf was removed.

By Ann Wayman

Top Row Left to Right

H. calistophylla *Green*...**Of all of the beautiful colors that are displayed in the hoya genus, the browns, greens and yellows are the ones that always attract the most attention, especially when many of these colors are incorperated into one species. Starting with H. calistophylla we have dark brown corolla tips with the rest of the corolla a very pretty waxy tan color, or sometimes yellow. The corona is pure white. When it comes to fancy foliage, this is one plant that has no equal. The light green leaves are beautifully patterned with very dark, almost black veins. A great bloomer with a wonderful fragrance....Photo by Ann Wayman**

H. neoebudica *Guillaumin*.... This beautiful species has been circulating for many years as H. neoebudica. I understand it has now been placed into synonomy with H. samoensis. By any name it is one of the best of the best. It's a great bloomer, has gorgeous, neat, clean, medium green very smooth, waxy foliage. The flowers are fairly long lasting (about 7 days) are a very pale pink or sometimes a pinkish tan. The corona is the color of pink pearls with the same shimmery glow....Photo by Ann Wayman

Center Row Left to Right

Unknown Hoya species IML #1198....As a rule, I prefer that we use only named species in our Hoya Photo Gallery. However this species is so exceptional that I can't resist showing it off. An obvious member in the same complex of species that spawned H. meredithii and many others with huge leaves and fantastic vein patterns. The flowers are small to medium sized and a gorgeous butter yellow with sparkling pure white corona. I did not detect any fragrance but it may have a scent at night when the insects that pollinate it are out. A fast and strong grower....Photo by Ann Wayman

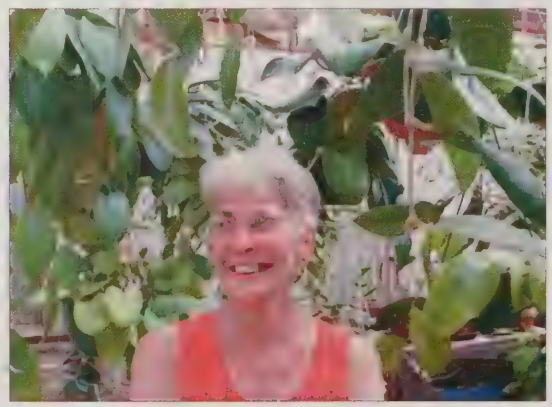
H. ridleyii.... I received this plant way back in the late 1980's as a species from India, no name. I was told by someone that it was H. ridleyii however I have never been able to find that name on any Hoya index, It has the appearence of a hoya from India and is in the H. verticillata complex. Other than that I know very little about it except it is one of the prettier of the H. verticillata's. The green petals are striking and the pinkish orange center of the corona is "the icing on the cake" Also has a wonderful fragrance...Photo by Ann Wayman

Bottom Row Left to Right

H. forbesii *King & Gamble* ...I first heard of this hoya species when I read about it in "The Malay Nature Journal" by Dr. R.L. Rintz. It was listed as rare and I could hardly wait to get my hands on it, but had to wait almost 30 years before it became available. It's listed as being off white but mine always blooms with very waxy looking banana yellow flowers. It's very pretty but I wish it had more flowers. It seldom has more than 5 flowers on each umbel but usually has many umbels open at once. The fragrance is pleasant but not spectactular. The foliage though not breathtaking is very pretty....Photo by Ann Wayman

H. bicolor *Kloppenburg*....I saw this photo several years ago and had to have this plant. I ordered a cutting, It rooted and grew beautifully but I couldn't get over how much the plant looked like a species in the H. australis complex. I finally got confirmation that the plant I thought was bicolor was in fact H. australis variety australis. So now the quest began to get the real H. bicolor species. Monina Siar in the Philippines sent me a cutting but it was confiscated by the USDA. At the same time that Monina sent the cutting to me she had also sent a few to Ted Green which he did received. He graciously offered to send me one of his. He did and it has grown like a weed. No flowers yet but a few little knobs are forming that may be peduncles. I'm anxiously waiting for blooms....Photo by Monina Siar

Gallery Descriptions by Ann Wayman



Hoya Photo Gallery

Odds N Ends

This is the area of our Fraterna Magazine where we get to correct, add, or in other words, fix what needs fixing from previous newsletters.

I have received word from Dale Kloppenburg that he has made an error in the identification of a published species H. viracensis *Kloppenburg & Siar* (Fraterna volume 19 # 4 Pg. 5-7). This plant has turned out to be a little known genera in the Apocynaceae family by the genus name of Clemensiella, It appears to consist of only 2 species: C. dischidioides and C. mariae .

Further notification of errors by Ted Green:

It has been brought to my attention that there are errors in two species of Hoyas that I have published, Hoya meredithii, Green and Hoya callistophylla, Green. In both cases, the errors are technical, in the description of the Type and must be corrected to make them valid.

For Hoya meredithii Green:

Existing description: Phytologia, Vol 64 No 4, Feb 1988, pg 304

TYPE: Bau, Sarawak, Eastern Malaysia, elevation 35m, on calcareous soils of the open, lowland forest. Not flowering in July 1980. Hort. Material, T. Green 'Meredith 80-05', Wallace 851980: Type Bishop Museum, Duplicate, Britton Herbarium, New York Botanical Garden.

Correction:

Holotype: Bishop Museum, 511439 hic designatus, ex hort T. Green of Kaaawa, Hawaii, Lectotype (NY)

For Hoya callistophylla Green

Existing description: Fraterna , Vol 13 #4, Pg 2 Oct-Dec 2000

Holotyp: Bishop Museum, Ted Green No. 201 ex hort. Ted Green of Kaaawa, Hawaii. From Nabawan, Sabah, Eastern Malaysia SBG 85190/BJ 84304

Correction:

Holotype: Bishop Museum, 685690 hic designatus ex hort. T. Green of Kaaawa, Hawaii. Collected at Nabawan, Sabah, Eastern Malaysia

Ted Green

Green: Plant Research

Kaaawa, Hawaii

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We stock several flower color forms of Hoya archboldiana, coronaria, imperialis, and onychoides, and novelties such as Hoya imperialis 'Mosaic', and several flower and leaf forms of Hoya finslaysonii.
New variegated selections include Hoya archboldiana 'Bold Edge', Hoya incrassata 'Moonshadow' and 'Eclipse', Hoya kenejiana 'Nugget', Hoya macrophylla 'Pot of Gold', and Hoya kerrii 'Chanrit's Choice'.
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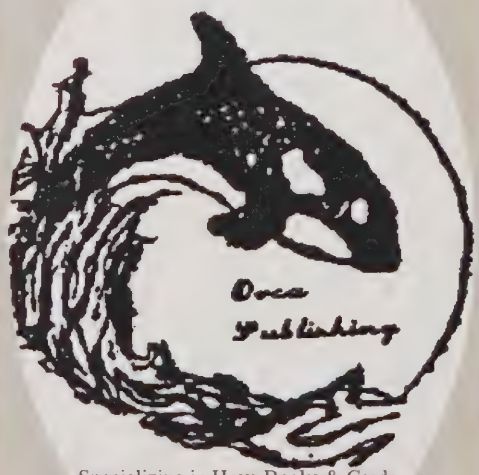

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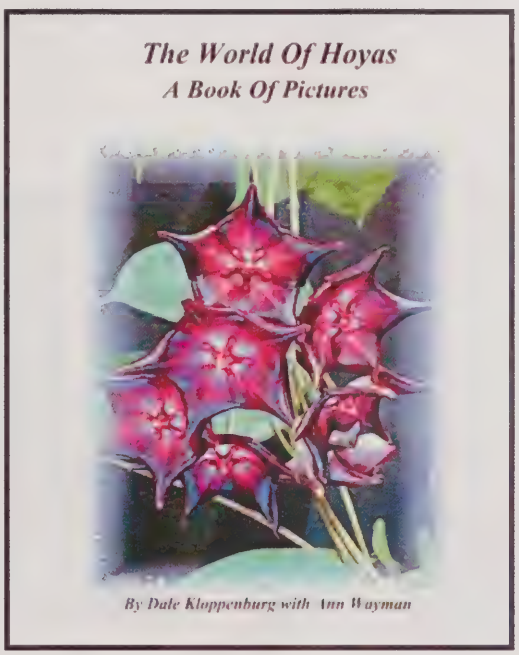
HOT! HOT! HOT!

Nothing like this has ever been attempted before! Dale Kloppenburg's wonderful text in "The World Of Hoyas" has been kept intact, while all the old black and white photocopies of herbarium sheets have been replaced with full page, full color photos of beautifully staged foliage shots with large photo insets of flower umbels that represent the particular species.

Some of the very best photographers in our organization have participated in the publishing of this book with many beautiful photographs, all labeled and correctly identified to the best of our knowledge.



If you have ever wondered what an entire plant, or even the leaves and growth pattern looks like when you see an especially beautiful umbel of hoya flowers, now is your chance. This beautiful book has been professionally bound in perfect binding with a semi-soft vinyl cover. 260 pages with contains several blank pages at the back for notes. Available now. Just $48.00 for the book plus $2.85 book rate postage in the U.S. Postage for Flat rate Air Express in Canada is $11.00 U.S. and overseas Flat Rate Air Express is also $11.00 . Surface mail is available but takes approximately 6 weeks.

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Hoya aldrichii *Hemslley*

There are 2 Christmas Islands in the tropics, one in Micronesia and the other west of Java, in the Indian Ocean. I don't know how many hoyas there are on the western one but undoubtedly the prettiest is Hoya aldrichii. I had never seen it alive – only as a herbarium sheet and the description.

Several years ago when I was at the Canberra National Botanical Garden, in Australia, I was given a cutting labeled H. aldrichii which eventually grew into 2 specimen plants that flower several times a year. Actually, it is quite a husky plant, a strong grower that has easily withstood the bright sun where I grow it. Normally the leaves develop a reddish cast and if the plant dries up the most exposed leaves will burn.

According to the description, the ½" flowers may be white or pink tinged with a large rose pink corona but the clone that I have is a decent pink. The fragrance is very delicate. The sap is milky white

CULTURE

I would consider this an easy plant to grow at room temperatures, in strong light, with moderate watering and light fertilizing – a great addition to any Hoya collection.

Ted Green

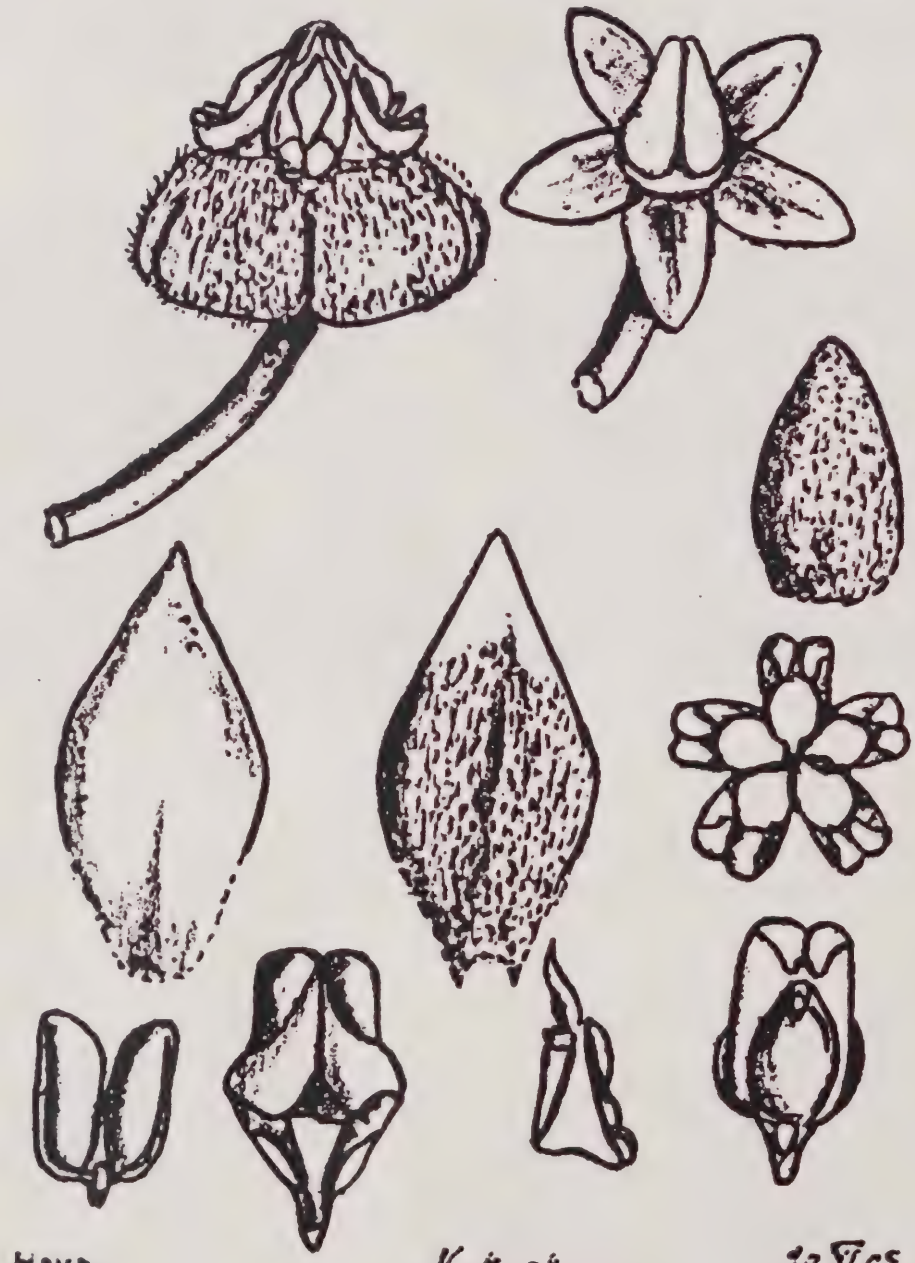
Green Plant Research

Kaaawa, HI

Hoya incurvula Schlechter

Sheet #20451 (B) 20 November 1909

Collected by Dr. Schlechter on Lokon River, Celebes



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FRATERNA

Official Bulletin Of The

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Hoya endauensis *Kiew*

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Errors of fact may occur from time to time in "Fraterna", it is the policy of the IHA to publish corrections of fact, but will not comment on matters of opinion expressed in other publications.

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Table Of Contents

Front Cover: Hoya endauensis Kiew (Photo by K.F. Yap)

Page 2	Declaration/Masthead
Page 3	Table Of Contents
Page 4	Editors Note By (Ann Wayman Editor)
Page 5-7	Our Cover Story (Photos and Descriptions by Dale Kloppenburg)
Page 8	Advertisements
Page 9-12	New Species H. heuschkeliana Subsp. caganoae
Page 13-16	New Species H. querinoensis
Page 17-19	New Species H. ramosi
Page 20-21	Advertisements
Page 22-25	Study Of H. verticillata
Page 26-27	New Hoya Society in France

Note From The Editor

This Is Important, Please Read This

In the last issue of Fraterna, 3rd quarter 2007, there were some copies that had page 5 printed upside down. Since it was not cost effective to send out corrected pages at the time, I will be printing pages 5 and 6 and sending them to everyone on our membership list in this, the 4th quarter issue in order to take advantage of the bulk rate postage. Please look for your corrected page in this envelope.

On another note, I find that I have literally thousands of photos that I have taken over the years and had extras printed when I was still putting in the actual photos into the newsletters. I am fast running out of room to store all these extra photos that I have acquired, so Instead of destroying them, I have decided to share them with all of our members. For the next few years you will each receive a 3 x 5 or in some cases a 4 x 6 photo of some very beautiful hoyas. I will be putting one photo each quarter into the envelopes with your quarterly newsletters also. Be sure to look for them.

My husband has been very busy typing new labels for us as I was having trouble with my label program reverting to the old expiration date on the labels when members renewed their subscriptions. We had to buy a new label program and I simply didn't have the time to learn a new program so husband to the rescue! As he typed the information in, he checked with my hard copy accounting system in order to make sure it was correct. Please be sure to check the expiration date on the bottom right side of your address label and renew in a timely manner as this new program will automatically delete members who have not renewed. In case you renew after you have been deleted, you will still get your current issue but will have to wait until the next quarter so it can go out in the bulk mail post, plus the foreign mail will have 2 issues in the envelope instead of one.

The last quarter of each year is the time of year when we publish new Hoya species and in this issue you will find 4 of the newest species. Hoya endauensis which has been around for awhile has also been included in this issue with the inner reproduction organs photographed and described.

The Hoya verticillata is another old timer that has been around for many, many years but has been confused with other species that have little or no characteristics to place them in the species H. verticillata. This is not a republishing of G. Don's species but is instead a study in comparison to show the differences in the species that have been lumped erroneously into synonomy with Hoya verticillata.

Please look over our advertisement pages and patronize those who place their advertisements in our pages. In all cases I have personally purchased plants or cuttings from these businesses and find them to be honest, the service is wonderful, and the labeling is as correct as any of us can be in this business. The hydroponic system from Canada of growing plants is a great system for starting hard to root cuttings as well as growing full sized plants.

Due to the many extra pages in this issue, there will be no photo gallery this time.

Ann Wayman

Editor

Hoya endauensus Kiew 1989

Type description:

In The Malayan Nature Journal 42 (1989) 262-265. R. Kiew. Hoya endauensis sp. nov. Hoya endauensis is presently known only from tributaries of the Ulu Endau, where it grows on trees along river banks. This new species adds to the growing list of endemics recorded from the Ulu Endau (Kiew et al., 1987), which is in the process of being gazetted as a state park.

Foliis glabris ovatis-cordatis apicibus acutis 2 ad 2.5 cm longis et 2 ad 2.5 cm latis a congeneribus Peninsulae Malaysiae divisa. Typus: R. Kiew RK2746 (UPM) Sg, Jasin, Johor. Glabrous epiphyte climbing with a thin stem (1.5 mm thick in dried state (with internodes 6-9 cm long. Stem with climbing roots at the nodes and a more expansive root system developing below the leaves, Leaf ± sessile. Lamina ovate-cordate, humped with margines appressed to bark of supporting tree, 2.2 cm -2.5 by 2.5 cm, apex acute, in life succulent (not tough), plane above and venation obscure in life, 3 pairs of veins just visible in dried state, in life pale yellow-green above and below, upper surface sometimes spotted orange (by algae), margin not thickened.

Inflorescence a pendant, axillary, sparsely-flowered corymb. Peduncle 23-45 mm long and 1 mm thick in dried state, distal part (2-7 mm long) covered by fruit scars, Pedicels very slender, 5-8 mm long. Flower buds pendant, 4 mm across, pale green suffused purple-red towards the base. Calyx pale green, glabrous, lobes oblong, 1 by 1 mm, apex rounded, pustulate on outer surface. Corolla glabrous on inner and outer surfaces, 4 mm across; lobes triangular, 2.5 by 2.5 mm. apex acute. Corona 3 mm across apex of upper lobes upturned and acute, lower lobes sloping down from and projected beyond upper lobes. Caudicles and pollinia broadly winged, 1 mm long. Ovary ovoid, 1 mm long. Fruit unknown.

Ecology: It is an epiphytic climber growing in partial shade on trees along river banks at c. 75 m a.s.l. Distribution: Endemic to Ulu Endau, Johor, Malaysia. Specimens examined: Johor, Ulu Endau: Sg. Salat- 3 July 1985 R. Kiew s.n. (UMP). 2 June 19898 R. Kiew RK2746 (UPM). In vegetative characters it most resembles H. curtisii K & G., which is also a slender climber, but which has small (13 by 13 mm), orbicular leaves, which are apiculate. It also differs from H. curtisii in indumentum (H. curtisii is hirsute) and inflorescence characters (Inflorescence of H. curtisii have peduncles to 5 mm longer are sessile); Kiew, 1987. In reproductive characters H. endauensis is most similar to H. lacunosa Bl. in its pendant, stalked inflorescence, in the shape of the corona, which has downward sloping lower lobes, and in the broadly winged caudicles (illustrated by Rintz, 1978). However H. endauensis is different in having glabrous corolla; that of H. lacunosa has inner surfaces covered by long, thick hairs. The leaves of H. lacunosa are also different. Usually they are longer than broad (2.5 - 3.5 by 1.5 - 2.5 cm) and have a thickened margine. In addition H. endauensis has smaller flowers (the corolla is 4 mm in diameter) than either H. curtisii (7mm) or H. lacunosa (8mm).

Translation: Leaves glabrous ovate-cordate apiculate acute 2 to 2.5 cm, long and 2 to 2.5 cm, wide, diverse from peninsula Malaysia co-generics.

Data and pictures from flowers sent by Kim F. Yap, Singapore 9/28/07 13 flowers in Kew solution.

Side view of the calyx and pedicel enlarged about 8X. Pedicel: curved, terete, glabrous, 0.85-1.20 cm. long, 0.08 cm. in diameter, surface finely granulate.

Side view of the calyx showing the ovaries enlarged about 8X.

Ovaries: narrowly pyramidal, glabrous, dark colored, 0.09 cm. tall and 0.05 cm. wide at base of pair.

Ventral surface of a flower enlarged about 8x. Linear sepals do not reach the corolla sinuses, corolla is revolute, the surface is glabrous.

An individual scale enlarged about 32X. Mostly, showing the obtuse rounded thin outer coronal lobe. Inner lobe here not clearly delineated.

Inside surface of the revolute corolla enlarged as above, this surface is finely puberulent, notice the typical pentagonal thickening area around the center. On many of these flowers one lobe had a thickened butter yellow area noted here on the right lobe.

Sinus – sinus	0.28 cm.
Sinus – center	0.24 cm.
Sinus – apex	0.34 cm.
Apex – center	0.50 cm.
Widest	0.30 cm.

View of the corona sitting atop of the corolla enlarged about 8X. The inner coronal lobes are

triangular spatulate with a short ridge on the dorsal surface. Outer lobes are obtuse, thin and here cupped inward, that may be due to slight drying of the flower? Coronal scales are sway-backed. Again note the circular buttery colored spot on the lower corolla lobe. The anthers are exposed in the center, membranous. Here the stylar crown in showing in the center of the corona, it is capitate in structure.

Lower view of a corona enlarged about 16X. Surfaces are glabrous, skirt is cleft below the anther wings, there is a thickened central 0.07 cm. long, column opening 0.06 cm. (ovary cavity).

Apex – apex	0.09 cm.
Apex – center	0.10 cm.
Widest	0.10 cm.

Another view of the flower and central corona that is relatively small, outer lobes obtuse turned inward, anther crown in center exposed.

Pollinarium enlarged ca. 165X

Pollinium

length	0.25 mm.
widest	0.12 mm.

Retinaculum

length	0.07 mm.
shoulder	0.04 mm.
waist	0.02 mm.
hip	0.03 mm.
ext.	0.02 mm.

Translators

length	0.13 mm.
width	0.01 mm.
depth	0.02 mm.

Caudicle

bulb diam.0.05 mm.

The caudicle bulb is funnel shaped at the inner end.

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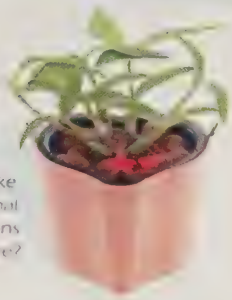

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Hoya heuschkeliana subsp. cajanoae Kloppenburg & Siar

Hoya heuschkeliana subsp. cajanoae Kloppenburg & Siar sp. nova Typus CAHUP 56574 hic designatus, Section Acanthostemma (Blume) Kloppenburg corolla campanulatum unique similar *Hoya blashernaezii* Kloppenburg sed parvum differt. Corona erectum similis *Hoya loheri* Kloppenburg sed bi-lobi brevi obtusi; coronae super paginate crystallinum differt.

This hoya subspecies cajanoae Kloppenburg & Siar is an Acanthostemma section hoya with a campanulate corolla like *Hoya blashernaezii* Kloppenburg but differs in being smaller; the corona is erect like *Hoya loheri* Kloppenburg but differs in the bi-lobes being obtuse; the upper surface of the corona lobes are crystalline.

This is another unique hoya species from the Philippines. It was collected by Blas F. Hernaez and Mary Ann Cajano, named for the latter. Miss Cajano is the director of the National Herbarium at the University of the Philippines, Los Banos. (UPLB). The herbarium designation is CAHUP.

Data and pictures from a flower of the Holotype sheet CAHUP 56574 follows:

Foliage: opposite**,** ovate 2.5 – 4.8 x 1.9 -2.9 cm. glabrous, flat with edges slightly rolled under, lower surface finely circular granulate (pustulate). Petiole curved 0.8 cm. long , terete, glabrous with a groove above near leaf blade.

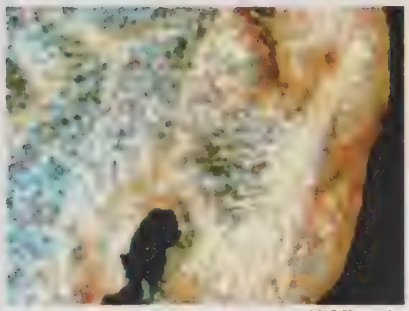
Peduncle: strict, axillary, 1.55 cm. long.

Calyx on pedicel enlarged about 8X. lobes nearly linear 0.12 cm. long and base width 0.06 cm. glabrous, membranous ligules present.

Ovaries ate long, narrowly columnar, glabrous 0.18 cm. long and base pair 0.07 cm wide.

Pedicel enlarged about 8X. Here on drying (herbarium sheet material) a little twisted , surface glabrous. Very short, 0.4cm. long.

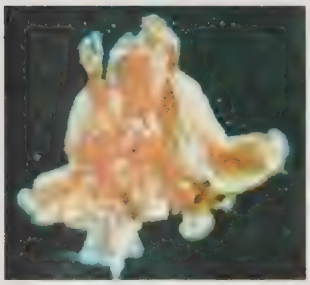
Corolla outside enlarged about 8X. The surface is granulose, cut about 1/3 to the center, campanulate; with lobe apices acute, collar a little thickened.



Corolla inside enlarged about 8X. The surface is finely puberulent, a little less so under the corona.

Sinus – sinus	0.30 cm.
Sinus – Apex	0.38 cm.
Sinus – center	0.25 cm.
Apex – center	0.50 cm.
Widest	0.30 cm.

Measurements difficult as corolla is campanulate.



Corona side view enlarged about 14X. This is an upright bilobed corona. The inner apex is spatulate covering a narrowly rounded apex, anthers with acute apices are slightly longer, dorsal lobe surface is convex in central portion and surface is finely crystalline, bilobes have rounded apices and are narrow, turned up at the ends, outer apex of coronal lobe is obtuse between the two bilobed extensions and its end is connected on each side to the lower bi-lobes. Column sticking out below is 0.10 cm. long and 0.09 cm wide in the center.

Apex of the corona greatly enlarged showing the inner apex of the coronal scales curved inward over the inner apex. Anthers just slightly longer.

Apex – apex	0.40 cm.
Apex – end	0.45 cm.
Widest	0.10 cm.
Ret. – ret.	0.05 cm.
Base width	0.19 cm. bilobed extensions 0.04 long.
Width to lobe apex	0.15 cm.
Central height	0.39 cm.

Side view of an individual coronal scale enlarged about 16X Note thin anther at the top above the inner coronal lobe, the bi-lobe on the left side, the central coronal lobe to the right with oval sides. Below are the bilobes extending to the right and beyond the apex of the central lobe. The beginning of the bi-lobe upper left is where the retinaculum would be. At the top is the rather wide based acute apex of the anther extending above the spatulate inner lobe.

Outer apical area of the corona greatly enlarged showing the obtuse upward turning bilobed ends, their surface is sulcate whereas the scale propped is granulose or crystalline. Most would probably identify it as finely postulate.

The stylar crown greatly enlarged with the clear anther apices in the background. The inner lobes of the corona have been removed, below is the central part of the corona.

Pollinarium enlarged about 85 X.

Pollinium

length	0.40 mm.
widest	0.21 mm.

Retinaculum

length	0.20 mm.
widest	0.14 mm.
ext.	0.07 mm

Translators

length	0.10 mm
depth ca.	0.05 mm.

Caudicle bulb diam. 0.07 mm. as near as I can determine.

Ratio: r/p 1.5 p/w 1.9

This species was collected under the auspices of the Haribon Foundation for Conservation of Natural Resources (Bicol National Park) Luzon. Camarines Sur, Ocampo Slopes Del Rosario access tract PLDT. To summit 110-800 m. May 16-20, 1991.

Reduced copy of the type sheet labeled Hoya bilobata Schlechter

Hoya querinoensis Kloppenburg & Siar sp. nova

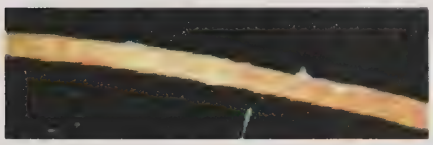
Apocinaceae subfamily Asclepiadoideae genus Hoya

This sp. collected by Maximo Wayet at Baguio Village, Querino 15 Sept. 1988, 150 m elevation, flower white. **Determination:** this does not fit any previous known species in Philippines.

Diagnosis & Description:

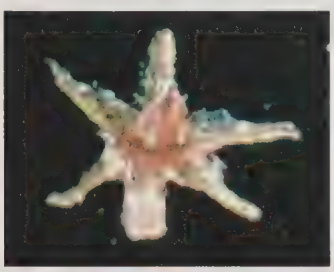
Hoya querinoensis Kloppenburg & Siar sp. nov. Typus CAHUP # 41946 hic designatus similis *Hoya fischeriana* Warburg in Perkins Fragmentia Florae Philippineae1(1904)129 sed corolla 1.2 cm. in diametro vs. 0.7 cm. per H. fischeriana et pedicellis 3.7 cm. longis vs. 1.5 cm; sepalis 0.15-0.07 cm. longis anguste lanceolatis vs. 0.1 cm. longis et late lanceolatis.

Flowers from the herbarium sheet reconstituted with Kew solution and photographed with a Olympus MIC-D digital microscope:



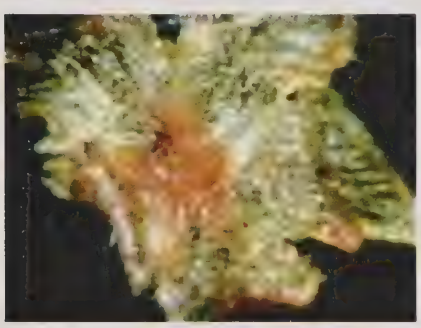
Pedicel enlarged about 8X. Slightly curved, terete, glabrous, long….. 3.7cm. and 0.04 cm. in diameter.

Outside view of the calyx enlarged about 8X. Sepals are long and narrow, ciliate, centrally a little thickened. Below center is the cut off pedicel. Apex is acute, a slight overlap at the base.



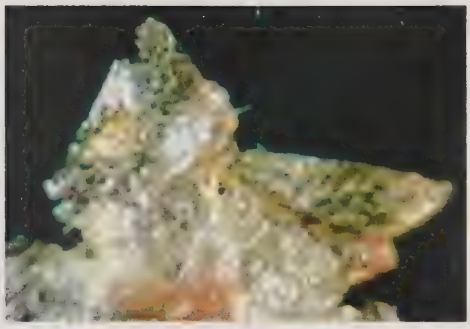
Inside view of the calyx, again the cut off pedicel is in the center below. Only a slight overlap at the base of the sepals, ligules are present, all glabrous.

Sepal: apex to base 0.15 - 0.17 cm. long and at base 0.05 cm.-0.09 cm. wide. Edge with a few cilia.
Ovaries: 0.07 cm. tall, base pair 0.06 cm. wide, glabrous.



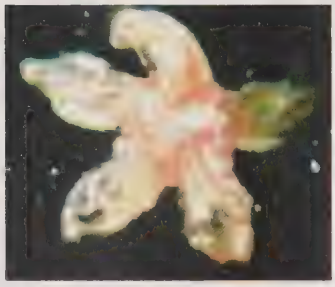
Outside surface of the corolla enlarged about 8X. Corolla lobes are wide in center somewhat conduplicate at the sinuses, glabrous. Apex is acute.

Sinus – sinus	0.25 cm.
Sinus – center	0.24 cm.
Sinus – apex	0.52 cm.
Apex – center	0.60 cm.
Widest	0.34 cm.

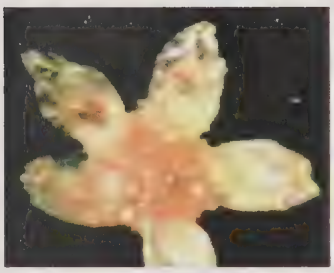


Corolla view of the outside at the center that is a little thickened and somewhat convex outwardly at the center collar.

Inside view of the flower with corona intact, enlarged about 8X. Coronal lobes reach or exceed the corolla sinuses. Corolla surface is pubescent.

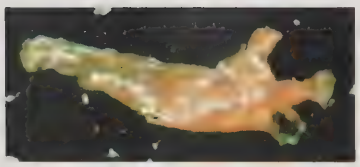


Bottom view of the corona. surfaces are sulcate, glabrous. Scale apex is narrowly obtuse, channeled from apex to in from the sinus area. Center is a raised column 0.05 cm. tall.



Top view of the corona enlarged about 8X. Inner lobes are spatulate and nearly reach the center, dorsal with a long central keel and a small umbo forward, outer apex acute. Anther wings are narrow with pointed apex.

Apex – apex	0.25 cm.
Apex – center	0.28 cm.
Widest on dorsal	0.13 cm.
Ret. - ret.	0.08 cm.
Ret. – center	0.05 cm.
Aw. – aw.	0.12 cm.
AW. – center	0.10 cm.



Side view of a coronal lobe enlarged about 16X. Inner lobe slightly raised, scale outer apex is actually raised, surfaces finely sulcate and glabrous. (some of stylar material to the right center).

Photo with Epson digital camera of the retinaculum. Arrow is measurement scale. Head is 0.1 mm long.

Retinaculum:

length	0.20 mm.
shoulder	0.15 mm.
waist	0.06 mm.
hip	0.10 mm.
ext.	0.02 mm.

Pollinium:

length	0.40 mm.
widest	0.19 mm.

Translators:

length	0.14 mm.
depth ca.	0.03 mm.

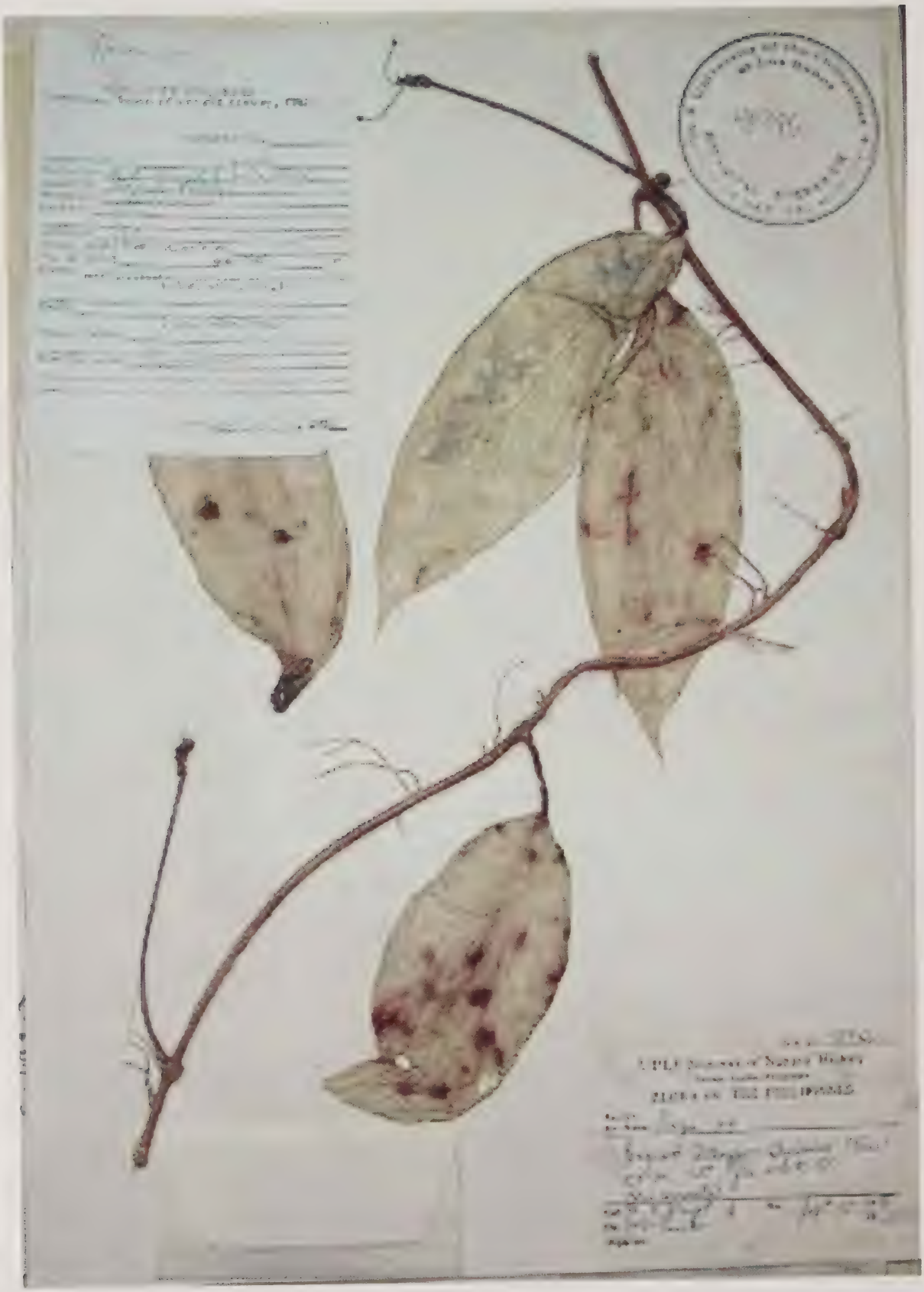
Ratio: ret/pol 1.8
poll width/length 2.14

Foliage: opposite, glabrous, elliptic-lanceolate apiculate acute, quintuplinerved, 16.5 cm. long x 5.5 cm. wide. Petiole 2.5 cm. long.

Stems with long filiform adventitious roots

Peduncle: 2.6 – 9.7 cm. long on sheet below, glabrous.

Collected by Maximo Wayett, Benguet, Diffin, Querino, flowers white to pale pink.



Hoya ramosii Kloppenburg & Siar

Collected by Ramos & Edano July- September 1928, Catanduanes, Philippines

Hoya ramosii Kloppenburg & Siar sp. nova. Typus #75500 (PNH) hic designatus, Section Acanthostemma (Bl.) Kloppenburg, Isotypes (UC) (PRE), similis *Hoya gigantangensis* Kloppenburg, Fraterna 4:1992 sed corolla aliquantum campanulatam non revolutam, alae antherarum duplexas singularis, biloborum protractus gradatim 0.25 cm. longe ultra lobules apices; lineares, differt.

Hoya ramosii Kloppenburg & Siar is similar to Hoya gigantangensis Kloppenburg but different in that the corolla is somewhat campanulate not revolute, leaf blade is narrow not elliptic-lanceolate, the anther wings are unique being double sided, the bilobes are straight (linear) projecting gradually 0.25 cm. beyond the lobe apex.

Type sheet material follows:

Pedicel, calyx with ovaries enlarged about 8X, sepal edged membranous, ragged some with a few cilia., extend to the corolla sinuses, 0.11 cm. long x 0.08 cm. widest, ends obtuse. Calyx diameter 0.30 cm.

Ovaries: bottle shaped, 0.13 cm. tall and 0.08 wide at base pair.

Top view of a flower enlarged about 8X. Corona is upright (raised center) and very extended bilobed 0.25 cm. long.

Corolla

Sinus - sinus	0.25 cm.	0.22
Sinus – center	0.25 cm	0.26
Sinus – apex	0.30 cm.	0.24
Apex – center	0.50 cm.	0.35

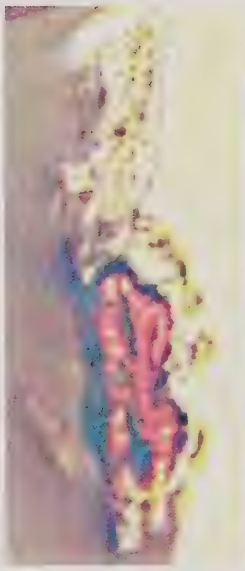
Another flower, corolla would not open to expose the corona without tearing.

Bottom view of the corona enlarged about 8X. Bilobes are lance like with acute apices extending well beyond the apex of the outer lobe. The anther wings are very unusual with two wings on each side of the channel.

Top view of a corona enlarged about 8X. Note here again the shape of the bilobes and the enlarged anther wings.

Apex – apex	0.30 cm.
Apex – center	0.41 cm.

Pollinium from a flower Mostly only the retinacula and anther wing in one frame. This was the best I could do.



Hoya intermedia Schlechter # 75500 PNH

HOT! HOT! HOT!

Nothing like this has ever been attempted before! Dale Kloppenburg's wonderful text in "The World Of Hoyas" has been kept intact, while all the old black and white photocopies of herbarium sheets have been replaced with full page, full color photos of beautifully staged foliage shots with large photo insets of flower umbels that represent the particular species.

Some of the very best photographers in our organization have participated in the publishing of this book with many beautiful photographs, all labeled and correctly identified to the best of our knowledge.

If you have ever wondered what an entire plant, or even the leaves and growth pattern looks like when you see an especially beautiful umbel of hoya flowers, now is your chance. This beautiful book has been professionally bound in perfect binding with a semi-soft vinyl cover. contains 260 pages with several blank pages at the back for notes. Available now. Just $48.00 for the book plus $2.85 book rate postage in the U.S. Postage for Flat rate Air Express in Canada is $11.00 U.S. and overseas Flat Rate Air Express is also $11.00 . Surface mail is available but takes approximately 6 weeks.

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We stock several flower color forms of Hoya archboldiana, coronaria, imperialis, and onychoides, and novelties such as Hoya imperialis 'Mosaic', and several flower and leaf forms of Hoya finslaysonii.
New variegated selections include Hoya archboldiana 'Bold Edge', Hoya incrassata 'Moonshadow' and 'Eclipse', Hoya kenejiana 'Nugget', Hoya macrophylla 'Pot of Gold', and Hoya kerrii 'Chanrit's Choice'.
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We sell established plants only (no cuttings). If you see it on our website, it is in stock and available. (Please note that because of recent changes in plant import regulations for the European Union, we cannot ship to EU member countries.)

Hoya verticillata (Vahl) G. Don

In Blumea 40 (1995) 425-428 This species was placed into Synonymy with Hoya parasitica (Roxb.) Wall. ex Wight. In studying flowers and foliage from Vahl's Type sheets of Sperlingia verticillata and Sperlingia opposita I discovered the sheets were misidentified by Ruurd van Donkelaar as Hoya parasitica G. Don.

This misidentification negates the assertions made in the above mentioned treatises. In addition it is stated in this Blumea article " Sperlingia Vahl (Asclepiadaceae) is a synonym of Hoya R. Br. sect. Hoya (Asclepiadaceae). Its *two species are identical. The lectotyope, S. verticillata is the Basionym of Hoya verticillata (Vahl) G. Don,……". *In my examinations of Vahl's two species S. verticillata and S. opposita I have found that they are not identical.

Here are some of my findings:

1) **Vahl's two species (verticillata and opposita) are not identical.**
2) **Neither are Hoya acuta (H. parasitica.)**
3) **Corona and corolla of S. verticillata are smaller than H. acuta (H. parasitica)**
4) **Coronal scales dorsal surface is keeled vs. concave.**
5) **Corolla inner surface is pubescent vs. glabrous (by all early accounts).**
6) **Leaves are much smaller 5-7.5 cm. x 3.1 cm. vs. 7.5 - 17. x 3.7-7.5 cm.**
7) **Leave nervation 5-7 pairs anastomosing netted vs. 3-5 tuplinerved.**
8) **Corolla conduplicate (rolled at the sinuses) vs. not conduplicate.**
9) **Calyx small broadly triangular vs. linear.**
10) **Pollinia shorter 0.39 mm. vs. 0.48 mm.**

The keeled coronal scales are like some Philippine species but so far I can not find an Indian species from that area (E. India nor Deccan Peninsula S. India), that matches H. verticillata.

Sheet of *Sperlingia verticillata* Vahl, #72 II. 6-2. Annotated by R. v. Donkelaar March 1996 as *Hoya parasitica* (Roxb.) Wall. ex Trail. Note 4 leaves from closely packed nodes (2). Vahl toyed with the name "tetraphylla" then chose "verticillata", meaning whorled.

Scanned leaf actual size from **Sperlingia verticillata** Vahl. Note the reticulate venation, a long petiole with a groove on upper side. Apex of leaf here missing, (others short, tapered, acute). This leaf measures 7.5 cm. and in the middle 3.1 cm. wide with a slight edge roll under. Petiole is 1.5 cm. long; grooved on the upper side where there is a leaf gland at the attachment on the upper side.

Photomicrographs from a Type flower and data follow:

Photo of the dried flower enlarged about 8X. Pedicel: terete, filiform 1.65 cm. long and 0.04 cm. in diameter, glabrous, yellow, curved. Corolla upper surface densely pubescent. Coronal lobes exceed the corolla sinuses. Note the distinct keeled dorsal surface of the coronal scales.

Bottom view of the same flower enlarged about 8X. Calyx is small broadly triangular with a rounded apex and a few cilia. Acute coronal lobes project beyond the coronal sinus. Corolla underside is glabrous but granulose. Note the conduplicate (ears) on the coronal sinus area. Sepals do not reach the corolla sinuses.

Outside surface of the calyx and pedicel enlarged about 8X. Sepals membranous, overlap is about 1/3, base broad apex rounded; do not come near the corolla sinuses. Calyx outside glabrous but punctate. Inside glabrous, waxy appearing. Center – apex 0.14 cm.

Inside view of the calyx enlarged about 8X. Note the shape of the sepals. Edges with an occasional cilia, ligules at the bases, small dark colored, swollen.

Apex – base	0.12 cm.
Base	0.10 cm. wide.

Corolla outside view enlarged about 8X. This surface is glabrous with deep cut lobes, lobes folding under ear-like near the sinuses. Center raised in a oval 0.14 cm. x 0.11 cm. adjacent area slightly sunken and thinner in texture. Although flattened here the lower right lobe shows the conduplicate nature of this corolla (wide at the sinus and reflexed).

Inside view of the corolla enlarged about 8X. Inside is densely pubescent except for a small triangular apical area. Center is raised around a slightly sunken area which is of thinner texture.

Sinus – sinus	0.27 cm.
Sinus – center	0.20 cm.
Sinus – apex	0.33 cm.
Apex – center	0.45 cm., flower

flattened is 0.90 cm. in diameter.

Bottom view of the corona enlarged about 8X. One removed. The lower side is tightly channeled Scale outer apices are long drawn out tapering to a very acute apex. Short column in the center.

Top view of the corona enlarged about 8X. The inner lobes are raised and shortly spatulate and does not quite reach the center. Outer apex acute; dorsal is keeled from apex to apex. Anther wing very narrow.

Center – apex	0.30 cm.
Apex – apex	0.28 cm.
Widest	0.12 cm.
Anther wing- aw.	0.11 cm.

Side view of a coronal scale enlarged about 16X. Scale is about horizontal with the inner spatulate lobe raised. I believe this scale has narrow side lobes since the apex seems to be emarginate but it is difficult to determine with certainty.

Stylar crown enlarged about 32X. The crown is raised, narrow and with a small mealy capitate head, from a rather thin pentamerous base.

Retinaculum enlarged about 165X.

length	0.18 mm.
shoulder	0.10 mm.
waist	0.05 mm.
hips	0.06 mm.
extensions	0.05 mm. or maybe none.

Translators

length	0.05 mm.
depth	0.04 mm.

Pollinium enlarged about 165X. Remember this is from a plant probably mounted in 1804, so it is over 200 years old. Here it is a bit distorted but we can see there is a rather wide vacuole in from the pellucid edge and the pollinia is rather wide for its length.

length	0.39 mm.
widest	0.18 mm.

I suppose the pollinia actually may measure slightly longer. All the measurements here are smaller than any of the *Hoya acuta* Haw. group, that I have grown or collected. The above data is self supporting and reverses the conclusions asserted in Blumea 40 (1995)

Some information about Hoyas in France

Hi everybody,
Let me tell you some information about Hoya's in France and about myself.

I am Alexandre Gavrus, I'm 46 years old and living in Rouen / Normandy / France. I have a collection of about 185 species, varieties and hybrids of hoyas & others Asclepiadacae, growing in my house and in the office where I work.

I started my collection in 1995 with a classical H. carnosa from my grandmother from Romania (where I was born), and bought other different carnosa's, compacta and australis until 2001. From my two travels in Thailand in 2002 & 2005 I brought back more than 15 others (H caudata, imperialis, multiflora, kerrii, pachyclada, obscura, and an aff. verticillata which has not been identified. I have a lot of cuttings from the same time from garden and flower shops in France, Germany, Netherlands & Belgium.

View of my hoya-room (half greenhouse)

In 2006, I discovered both the "Serres d'Auteuil" (the Paris mains greenhouses, opposite to Rolland-Garros), who have à lot of very big hoya's, and the forum http://hoyas.monforum.fr, (created in 2005 by two Hoya lovers, Celine & Dominique). I had a lot of exchanges with Serres d'Auteuil (thanks to Christine, the warm greenhouse keeper) and members of the forum. Until begin 2007 I'm one of the moderators on the forum (Celine is the administrator). The others hoya's came from sellers and collectors, for example Paul Shirley, David Liddle, Torill Nyhuus and Ylva Kallander.

View in the warm greenhouse of Serres d'Auteuil

My passion is not only in growing hoya's, but in all the things involved with growing them, for example shooting pictures, studying and trying to pollinate hoya's (in collaboration with Alexandre Berche from Marseille). I hope to be able to announce soon (2008 ?) a new accidental hybrid, a cross 2006 between H. lacunosa & H. litoralis, I'm waiting for flowers.

At the end of 2006, I contacted 3 other people, Celine Jean, Olivier Gutierrez & Genevieve Louet, for the purpose that the four get together to create an association of hoya lovers. The association A.F.A.HO. (Association Francophone des Amateurs de Hoya) was started in 2007, and we have now nearly 50 members from France, Belgium, Canada, Algeria, Romania, Sweden. The goal of the AFAHO is : *"To Promote awareness, promotion, publishing, trade, culture, propagation and hybridization of hoyas in a spirit of entertainment, meetings, travel, collaboration, friendliness and good humour"*.
We look forward to close collaboration with other hoya associations, to share our knowledge of their culture and perhaps one day have meetings and travels between European and the collectors from other countries.

Our revue is Asclep-Hoya, a French language web-zine. The first issue was in September, the second issue is in preparation for December. It is a publication that could accommodate serious articles, and just sharing experiences. If there is enough interest, in the future, we could translate the revue in English
The web site, http://asclep-hoya.com is under construction.

SOMMAIRE
N° 1 - janvier - juin 2007
ASSOCIATION FRANCOPHONE
DES AMATEURS DE HOYA
A.F.A.HO
Editorial page 3
Installations des collectionneurs page 4
Hoya en vedette à découvrir page 7
Culture des hoyas page 9
Classement non scientifique page 12
Découvrir les espèces page 16
Reportage page 18
Portraits de membres page 19
Vues photos page 20
Autres ressources page 22
Rencontres - manifestations page 24

Asclep-Hoya n° 1 – cover, summary, inscription form

We had our first meeting AFAHO the 27 October at Serres d'Auteuil and we had as guest speaker Torill Nyhuus from Sweden, who showed us pictures of her hoya collecting in Asia. A small group of us at the same occasion had dinner with Dorothy & Ted Green, who were in Paris.
We could receive members from abroad. The subscription is 10 Euro, just send an e-mail to me at kl55555@club-internet.fr, to receive the subscription form.

Some web-sites of our members could be found on :
http://www.flickr.com/groups/hoyasmonforumfr, for exemple :
Celine : http:// hoya.over-blog.com
Sylvine : http://sylvinebr.free.fr
Djamel: http://dwaittaleb.free.fr
Dominique: http://perso.orange.fr/mes.hoyas
You can find on www.flickr.com a lot of pictures from the forum collected and posted by Frederic Didembourg (from Belgium). I am in the process of creating my own internet website, maybe next year.

To finish, we project a hoya collecting trip to Asia fall 2008 (maybe Sabah, Sarawak or Johor in Malaysia). People who might be interested can contact me by e-mail : kl55555@club-internet.fr.

Project of cover for the n° 2 of Asclep-Hoya

Written by **Alexandre Gavrus** (Pakeha on hoyas.monforum)

Hoya endauensis
Johor, West Malaysia
(c) K.F. Yap, 070913

Our Cover Story

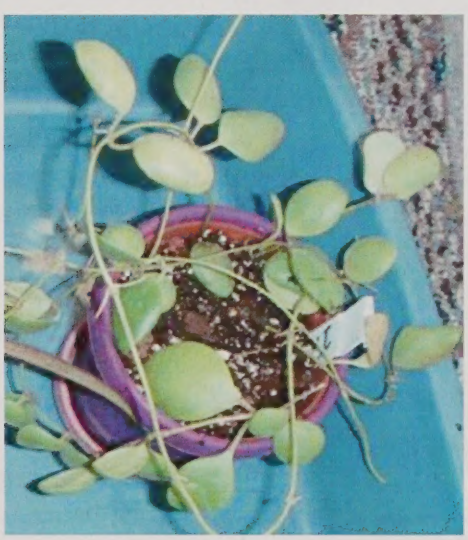
Hoya incurvula Schlechter

There are a few of the smaller flowered hoyas that I consider really beautiful. This happens to be one of them. The very small ones are cute, adorable, darling, exquisite little jewels and other epithets that I attach to my hoyas. Of course there are those hobby growers (and more than a few nursery growers) who go "hog wild" over every hoya that opens even one umbel of flowers and it is understandable. I don't believe I have ever seen a hoya that I thought was ugly.
I received this species approximately five years ago in a shipment of unknown hoya species from Sulawesi...wouldn't you know every single one of them had a label that just said "unknown species from Sulawesi" Out of this batch of unknowns the folks who do research into the identification of this genus have finally identified all but a few and one was given a name and published as H. tomatoensis, because it was not able to be matched with anything we had. I still have one that I truly love and hopefully one day soon it can either be identified or given a name.

The cover photo was sent to me for identification by a friend on a hoya forum. I think her name was Denise but I can't remember her last name. The photo is so exceptionally good that I can actually see the incurved coronal lobes with the naked eye. The color on these flowers was a bit of a surprise as mine always blooms a rather off white with a lavender pink center. I assume it's because of the difference in growing methods or she may have a different clone than I have. For whatever reason, this bright pink is stunning.

The foliage on this species is also exceptional, and very distinctive. The small leaves are rather round and a dusty looking pea green. They cup under slightly like they're trying to hide something underneath. The name "incurvula has often been confused with the cupped habit of the leaves, however the leaves cup downward making them recurved rather than incurved. Grown on the wet side and in the shade, they elongate into rather long, paddle shaped leaves.

Photos below by Tammy Caldwell



A Visit to the Hoya collection in the Hortus Botanicus of Leiden University

As a part of the National Plants Collection the hoyas are located in the University Botanical Garden (the Hortus Botanicus) in Leiden, Netherlands. There are several old university gardens in the Netherlands, in Utrecht and Amsterdam but Leiden being the oldest The hoya collection consists mainly of the former Ruurd van Donkelaar collection.

Founded in 1590, in the times of the great discoveries and the VOC , this Hortus has through his gardens introduced newly discovered products like tomatoes, potatoes, maze and tobacco to the rest of Europe. The famous Swedish botanist Carl Linnaeus (born over 100 years later in 1707, visited its collections regularly). The oldest still living tree in the garden was planted in 1609.

After entering through the Palmhouse and through other collections I knocked on the doors of where I could see hoyas behind closed doors I noticed this part of the plant collections was not open to the public. The little sign WAS CLEAR "for research only" but having met the Hortolanus (headgardner greenhouses), Art Vogel on another occasion recently, while lecturing about his field trips to Borneo and making inventories of specific families of Orchids (his speciality), he happily opened the doors for me.

The overall impression of his years long experience visiting and collecting for the Hortus collections knowing and witnessing the mass destruction in a rapidly changing Borneo (and surely in many other places), has made him a very unhappy man. The organized mass destruction of the earths rainforests for still more short term profits from ever more palm-oil plantations. First the logging industry mobs sawed down millions of acres of trees and now the construction crews (or should I say destruction crews)? are moving in with plows and bulldozers. It's all very sad and also weird that so very much is legally destroyed while the CITES prohibits collecting and research in those Regions. So much lost forever!

"There are not that many interested in this part of the collections" , he continued, "but just the other day there had been two biologists busy for some time with research on the Hoyas". Tatyana Livshultz was working on Dischidia and Livia Wanntrop on Hoya's of Borneo.

I strolled through the two greenhouses at leasure and enjoyed the very neatly exhibited hoyas all in brown hanging containers. There was a (very) warm department kept year round at 20-25 C. (68° to 77° F.) but now in full sun it must have been over 35 C. (95° F.) and an automated misting system gave it a real rainforest feel. The building itself was built in the 1930's and though very well kept; it shows. Lots of old piping and hand controled window-openers. The structures are in good condition but the signs of age and wear are obvious. It keeps the Headgardner busy controling and managing the climate. Next to it an identical but somewhat cooler (14-20°C) (57-68°F.) department which houses also the Dischidia collection. I had no idea there where as many species as that. These very nice, mostly small to tiny Asclepiads, cousins of our hoyas are kept mounted on pressed coco fiber mats (5 x 5 x 40 cm) cut from plates (40 x 60 cm) and hanging from wire hooks. Because of the high humidity these mounts where overgrown with all kinds of moss and this gives a real natural and very pleasant look. I stopped counting but there are over a 100 different ones, at the least. Many without names but only IPPS/GPS and inventory numbers plus the discovery locations.There where also several hoyas mounted this way not only looking great but they thrived thus living real epiphytic lives. I spotted a nice H. caudata with